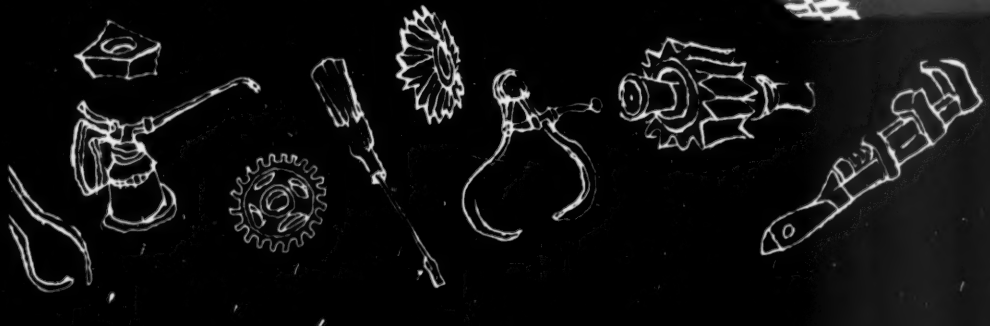
March 1953 50¢

UNITED STATES ARMY

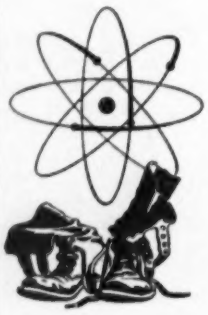
COMBAT FORCES Journal

Infantry Journal Artillery Journal

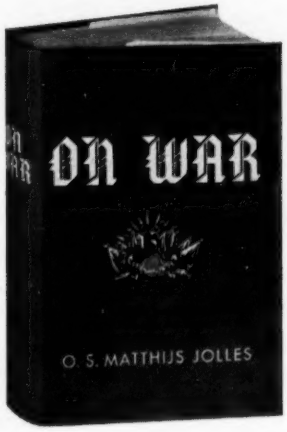


Three standard military books from

COMBAT FORCES PRESS



Clausewitz ON WAR



TRANSLATED BY O. S. MATTHIJS JOLLES

Military techniques and weapons change with the years, but military principles remain constant. The greatest exponent of the unchanging principles of war in the last century and a quarter has been General Karl von Clausewitz. His great work, *Vom Kriege,* is now available, complete and unabridged, in this first modern translation. With this edition, *every* officer, every student of war can turn to Clausewitz for instruction, and for interpretation and prediction of the fortunes of war. Here you'll find the unchanging *principles* of attack . . . defense . . . supply . . . grand strategy . . . tactics . . . plans—set forth in surprising detail by the master philosopher of war.

$3.50

AIRBORNE WARFARE

By MAJ. GEN. JAMES M. GAVIN

Since General Gavin's now-standard work on airborne warfare was first published, we have had troops fighting in Korea. The methods employed to get them there—to supply them—to take them out when they are wounded —follow closely General Gavin's predictions of the characteristics of future war. Movement by air has been of tremendous importance in Korea, and it will be infinitely more important if there should be other Koreas or possibly World War III. In this book you will find the conceptions of a great commander of airborne troops as to how we will employ the idea of air transportability in the future, even as it is helping us *now* to solve our problems in Korea.

$3.00

SOVIET ARMS and SOVIET POWER

By GENERAL AUGUSTIN GUILLAUME

General Guillaume, French Military Attaché at Moscow from 1946 to 1948, was in a unique position to gather the facts about Soviet arms and Soviet power. He tells, from authentic sources, how Russia fought the war, what she fought it with, why she won, when she knew Hitler could be beaten, and where lies the secret of Russia's might.

There is much to learn about the factors of strength in the Soviet military machine—how and why the Red forces have become the world's greatest challenge.

$3.50

UNITED STATES ARMY

COMBAT FORCES *Book Service*

1529 18th St., N.W. Washington 6, D. C.

ASSOCIATION OF THE U. S. ARMY

U. S. Infantry Association, 1893-1950
U. S. Field Artillery Association, 1910-1950

PRESIDENT
LT. GEN. GEORGE H. DECKER, USA (Inf)

VICE PRESIDENT
GEN. JOHN E. HULL, USA (Inf)

SECRETARY-GENERAL MANAGER
COL. JOSEPH I. GREENE, USA-Ret (Inf)

ASSISTANT SECRETARY
COL. ARTHUR SYMONS, USAR (Arty)

TREASURER
MARGUERITE MATTISON

ASSISTANT TREASURER
MAJ. ORVILLE C. SHIREY, USAR (Inf)

EXECUTIVE COUNCIL

For the term ending June 1953

MAJ. GEN. GEORGE I. BACK, USA (SigC)
BRIG. GEN. HARRY McK. ROPER, USA (Arty)
COL. ERNEST C. NORMAN (Arty)
COL. FREDERICK S. LEE (MPC)
COL. LAWRENCE L. HEINLEIN, NGUS (CE)
COL. ROBERT F. COCKLIN, NGUS (Arty)
Vacancy

For the term ending June 1954

GEN. WADE H. HAISLIP, USA-Ret (Inf)
MAJ. GEN. WILLIAM H. ABENDROTH, NGUS (Armor)
BRIG. GEN. GEORGE C. STEWART, USA (Inf)
BRIG. GEN. HARRY H. SEMMES, USAR (Armor)
BRIG. GEN. CLAUDE H. CHORPENING, USA (CE)
COL. CHARLES A. H. THOMSON, USAR (Inf)
CAPT. WILLIAM M. GLASGOW, JR. (Inf)

For the term ending June 1955

LT. GEN. ANTHONY C. McAULIFFE, USA (Arty)
MAJ. GEN. EGBERT F. BULLENE, USA (CmlC)
BRIG. GEN. MALCOLM F. LINDSEY, USA-Ret (Inf)
BRIG. GEN. JOHN C. OAKES, USA (Arty)
COL. RICHARD P. OVENSHINE (Inf)
COL. JOHN LEMP, USAR (Arty)
COL. CHESTER V. CLIFTON, JR. (Arty)

U. S. ARMY COMBAT FORCES JOURNAL

The Combat Forces Journal is not the mouthpiece of the Department of Defense. The fact that an article appears in its columns does not indicate the approval of the views expressed in it by any group or any individual other than the author. It is our policy to print articles on subjects of interest to the Armed Forces in order to stimulate thought and promote discussion; this regardless of the fact that some or all of the opinions advanced may be at variance with those held by the officers of the Association of the U. S. Army and the editors of Combat Forces Journal.

COMBAT FORCES Journal

EDITOR
Col. Joseph I. Greene, Inf-Ret.

ASSOCIATE EDITOR
John B. Spore

ASSISTANTS TO THE EDITOR
Col. Arthur Symons, Arty-USAR *N. J. Anthony* *Esther E. Bennett*

ASSISTANT EDITORS
Col. Robert F. Cocklin, Arty-NGUS *Maj. Orville C. Shirey, Inf-USAR*

Vol. 3, No. 8 **March, 1953**

Cover by Gil Walker.

TO THE EDITORS 2
WITH FORTITUDE AND FORESIGHT. *President Dwight D. Eisenhower* 8
THE TRUCK AND THE SOLDIER 11
WHERE ARE WE GOING? *Maj. Paul Hunt* 13
HOW DO WE ROLL? *Lt. Col. John H. Davis* 14
MOBILE MAINTENANCE MADE 'EM ROLL.
Lt. Col. Waldon C. Winston 18
TRUCKS FOR TRANSPORT. *Col. Ernest A. Suttles* 22
TRUCKS AND MUD 27
VEHICLES FOR THE INFANTRY.
Majors William R. Hughes and Larry W. Coker 28
THE TRUCKMAKERS AND THE SOLDIER. *K. T. Keller* 32
TRUCKS FOR THE AIRBORNE. *Maj. William D. Rabon* 35
EXPEDIENTS IN SHOP AND FIELD. *Capt. Lawrence W. Fite* 39
FRONT AND CENTER 42
FROM THE SCHOOLS 43
IRONS IN THE FIRE 44
BOOK REVIEWS 45
OFF-DUTY READING 48

COMBAT FORCES JOURNAL is published monthly by the Association of the United States Army. Publication date: 25th of preceding month. Publication, Editorial and Executive Offices: 1529 Eighteenth Street, N.W., Washington 6, D. C.

Copyright, 1953, by Association of the United States Army.

Entered as Second Class Matter at Washington, D. C., additional entry at Richmond, Va., under the Act of March 3, 1879.

Circulation Manager: *D. A. Mulloy* Assistant: *Doris Montgomery*

One year $5.00; two years $9.00 when paid in advance; three years $12.00 when paid in advance. Group subscriptions to units and activities of the Armed Forces $4.50 each when paid in advance. Subscriptions for libraries, civilian groups or activities, and others not eligible for membership in the Association of the U. S. Army $5.00 per year. Foreign subscriptions $6.00 payable in advance. For other rates write Circulation Manager, Combat Forces Journal, 1529 18th St., N.W., Washington 6, D. C.

Advertising Director: *Robert F. Cocklin* Assistant: *Lenna Pedigo*

ADVERTISING REPRESENTATIVES

New York Office
55 West 55th Street, New York 19, N. Y.
Judson 6-4099

San Francisco Office
Duncan A. Scott Co.
Mills Building, San Francisco, Calif.
Garfield 1-7950

Los Angeles Office
2978 Wilshire Blvd., Los Angeles, Calif
Dunkerque 8-4151

Advertising rates furnished upon request to any of the advertising offices

★ To the Editors . . . ★

Stress the Fundamentals

To the Editors:

"It's Situation No. 2" by General Randle in your December issue put the finger squarely on our most pressing training deficiency. In the clamor for new weapons and more and heavier supporting fires the capabilities of the individual rifleman, squad and platoon have not been developed to their full potential. A caliber .30 bullet can kill a man just as dead as a 105 shell so the relative economy of exacting the maximum effectiveness from our small arms is self-evident.

The comparison to the training of an athletic team is particularly fitting. A coach will spend weeks drilling his team in the fundamental plays and techniques until they develop the maximum coordination and skill of which they are capable. There are certain basic military plays (not necessarily just those enumerated by General Randle) for the individual squad and platoon to which the same approach should be made. Unfortunately too many of us think that the taking of an objective just takes plenty of guts, aggressiveness, and an overwhelming preponderance of supporting fires.

Present ATPs and training policies do not provide sufficient time or latitude for the development of training methods or exercises along this line. The principal factors are proficiency of the individual in the use of his weapon, proper utilization of terrain and team work between individuals and small units. In any tactical situation there is a certain combination of firepower, use of terrain, and maneuver that will insure success. The individual soldier, squad and platoon should be so thoroughly drilled in the basic plays and use of firepower, terrain and maneuver that they will automatically and instinctively do the right thing.

It is not my intention to belittle or underestimate the value of supporting fires, but merely to point out that our present training methods do not develop the full combat capability of our individual weapons and small units. When the fires of our artillery and supporting weapons are added to supplement the efforts of small units which have been trained to develop their full capability then we will begin to approach maximum combat effectiveness.

MAJOR CHARLES G. KING
164th Inf Regt
Camp Rucker, Ala.

SPECIAL AUTOMOBILE FINANCING SERVICE AND LOANS

To Commissioned Officers & Warrant Officers Wherever Located

Minimum restriction on the Movement of Cars Overseas

This organization founded in 1924 by a group of retired officers specializes in rendering financial assistance to officer personnel.

FEDERAL SERVICES FINANCE CORPORATION

Washington, D.C.

Alexandria, Va. ..... 113 No. St. Asaph St.
Augusta, Ga. ..... Marion Bldg., 730 Broad St.
Bethesda, Md. ..... 4550 East West Highway
Columbus, Ga. ..... 3257 Victory Drive
Honolulu, T. H. ..... 1410 Kapiolani Blvd.
Long Beach, Calif. ..... 110 Ocean Boulevard
Louisville, Ky. ..... 600 S. 4th Street
Panama City, R. P. ..... Ave. Nacional No. 29
Warrington, Fla. ..... 31 Navy Boulevard

February Cover

To the Editors:

Just received my February issue and see you identify the gun on the cover as a 155mm howitzer doing night firing in Korea. For my part I'd hate to be using a proximity fuze on any shell fired from "that" howitzer.

After serving five years with a 155mm gun battalion during World War II, I am tempted to ask if someone isn't off base on nomenclature. What makes it more disgraceful is that you have editorial assistants who seem to be artillerymen.

R. E. SPAULDING
5617 Philadelphia Drive
Dayton 5, Ohio

• Others besides Mr. Spaulding have called our attention to the lamentable and inexcusable error of identifying the weapon on our February cover as a "155mm howitzer" instead of a "155mm gun." But to Mr. Spaulding let us say that the cover was a last-minute selection and the artillerymen on the staff saw it, but didn't have a chance to check the identifying line, dashed off by another member of the staff as the linotype operator waited for it.

Resistance Movements

To the Editors:

Colonel Edward A. Raymond in "People's War," in your December issue makes some pertinent observations on guerrilla warfare. The tone, however, seems to give guerrilla warfare the pre-eminent place in what is the much larger operation termed "Resistance." In fact, save for a passing reference, Colonel Raymond seems to lump all the activities of Resistance under guerrilla warfare.

Julian Amery, in the March 1949 issue of *The Nineteenth Century*, has attempted to advance a few general propositions concerning the theory of the principles of Resistance. His definition of Resistance may help to place Colonel Raymond's article into perspective:

"Resistance is the name which we give to operations directed against an enemy (belligerents, opponents in a cold war, malevolent neutrals, etc.) behind his lines, by discontented elements . . . The gamut of such operations is very wide. It includes revolt, guerrilla, sabotage, terrorism, civil disobedience, strikes, 'go-slow' techniques, non-cooperation, the spreading of hostile or diversionist propaganda and the harbouring of enemy agents or escaped prisoners . . . Resistance indeed differs from revolution (or counter-revolution) only insofar as its operations are supported by an external Power or conform to the general military and political strategy of that Power. By definition, therefore, a Resistance movement draws its strength and inspiration from two sources: from the local forces of which it is composed, and from the outside Power which supports it."

LIEUTENANT RIGHTER
Madrid, Spain

Scale-Model Range

To the Editors:

In the November issue on page 40, under the caption "Scale-Model Firing Range" a photograph shows men getting forward observer training, standing up to make their adjustments. This is one method we MAAG advisors are *not* teaching the Chinese Nationalists. For the observer to be taught properly, he ought to be in the position he would actually be at an OP and not standing above the target. His standing position allows him to look over the hill that he is firing at. Also if the terrain board is an actual scale model, there should be wires stretched over the terrain board for the individual placing the rounds to be correct in their location. In this way the observer will obtain a truer picture of where his rounds land in reference to the target.

LT. ARTHUR H. LINDEMAN
Army Section
MAAG, Formosa
c/o PM, San Francisco, Cal.

Noncoms

To the Editors:

Reference "What's Wrong With the Infantry" in the January issue, the Sergeant did not miss a point. I thank him for his courtesy in not laying it on any thicker about us officers. I would like him to know though, that there are a great many of us who quite agree with him, but can't do a thing about it. Unfortunately we are as beat down as he is. Our one hope is that

YOU'LL HAVE

MORE FUN

when you Travel by Train!

ONLY THE RAILROADS offer you so much travel pleasure
—on orders, or on furlough.

You see more country . . . meet more people . . . have more comfort
when you travel by train. There's room to stretch your legs . . . real meals
. . . real beds . . . restful reclining-seat coaches . . . dependable schedules.

Next trip and every trip . . . for real travel enjoyment, use the Railroads,
America's most complete transportation system.

Attractive reduced fares for furloughees
Also 10% discount allowed for all military travel on transportation requests

The Railroads of the United States
America's most complete transportation system

ACTION PACKED!

Chase Assault Transports are now performing, as routine, functions which previously were deemed impossibilities—the delivery—ready for action, of heavy arms and equipment directly to front line areas, ***by landing*** in small unprepared fields.

Recent demonstrations of this new technique have proven beyond doubt that its potentialities for revolutionizing present military concepts are unlimited.

Chase Assault Transports ruggedly built to absorb the withering punishment of front line missions, stand alone.

Chase AIRCRAFT CO., Inc.
WEST TRENTON, NEW JERSEY
STROUKOFF AVITRUC

there will be enough real noncoms like him, plus enough real infantry officers to hang on and we may some day be in the position to iron it out. As the Sergeant wrote, the solution is so simple. The Marine Corps has had the answer for years. I can only remind him of the motto of a real infantryman, General "Vinegar Joe" Stilwell: "illegitimi nil carborundum."

I would welcome "SFC Armored Infantry" in my outfit any time.

MAJOR INFANTRY, RA
Fort Knox, Ky.

To the Editors:

Both "Sgt. Chesty" and "SFC Armored Infantryman" (January issue) express opinions I've stated many times. In as much as I am presently a commissioned officer, these opinions have tagged me as being "Too mean to mama's poor little GI."

One of the worst brain storms the General Staff ever had was the one which came up with the small, switch-colored stripes. In that shuffle we lost the three-stripe sergeant, the man who once just about ran the Army. In my first six months of service, I didn't even know there was anyone with more authority. Now we have men who automatically, or practically so, make corporal, a grade which is now only a high ranking PFC (in most outfits they are so numerous that they are required to pull KP and other fatigue duty).

I recently served in a command where I had two excellent SFCs with six and seven years in grade, and more years of service while another nearby outfit was promoting men with less than a year of active duty to master sergeant. And all because of the T/O.

The present set-up is the result of the discovery that it is easier to change the T/O so as to make an automatic promotion than it is to get a fair pay bill.

We now have, as the Sergeant said, too many chiefs. If a man needs $300 a month to live on, give it to him, but don't make him a M/Sgt for this purpose.

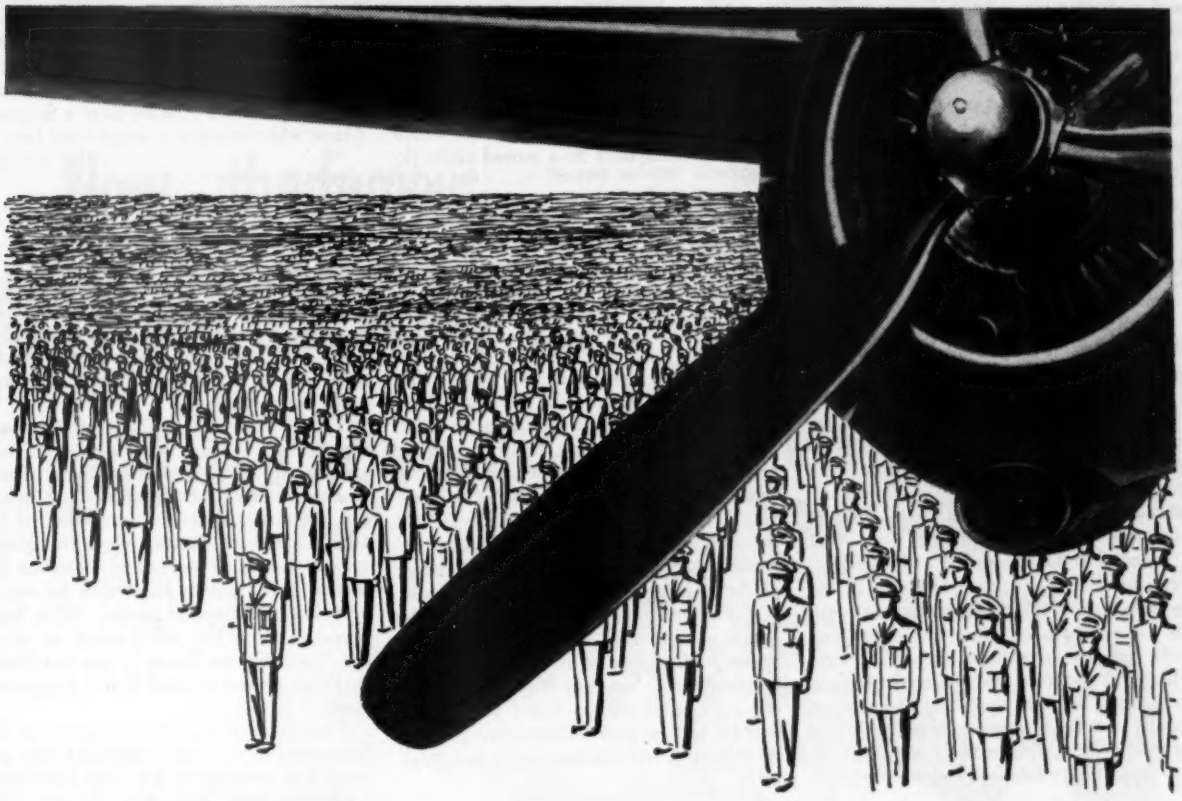
CAPTAIN L.J.W.
Jefferson City, Mo.

To the Editors:

"Eyes Right" to your January 1953 issue just received and read with great interest. After 11 years I still look forward to every issue.

"What's Wrong With the Infantry," was the brightest piece in the January number—along with "Iron Discipline Needed" (by Sgt. Chesty in "Letters to the Editors"). As an ex-first sergeant of an infantry company, I'll second both pieces.

We have far too many chiefs shouting orders. A first sergeant used to place a good corporal in charge and consider the job done. Now, if a corporal is selected, the "Old Man," eager to have an active hand in "running" his company, says "Put some rank in charge of those men." So after much arguing on the subject of "Who in the hell is running this outfit" the corporal goes back to cleaning the latrine or sorting



SAVED—13,017,781 Military Man Hours!

In 1952 the Scheduled Certificated Airlines, in regular service and charter flights, carried 682,605 passengers on official military transportation requests. This total is made up of actual counts plus some estimates based on average trip lengths.

Compared with the speeds of the fastest surface transportation, the result in terms of military man hours saved is 13,017,781!

This conservative estimate of over 13 million man hours saved in one year is an excellent indication that it's good business for the Armed Forces to move more personnel — individuals and large groups — via the Scheduled Certificated Airlines.

(10% DISCOUNT — for official travel on TR's . . . covers Full Service.)

Saving the Military *MILLIONS* of Vital Man Hours

THE *Scheduled Certificated Airlines* OF THE U.S.A.

ALASKA AIRLINES	EASTERN AIR LINES	PIONEER AIR LINES
ALLEGHENY AIRLINES	FRONTIER AIRLINES	RESORT AIRLINES
AMERICAN AIRLINES	LAKE CENTRAL AIRLINES	RIDDLE AVIATION
BONANZA AIR LINES	MOHAWK AIRLINES	SOUTHERN AIRWAYS
BRANIFF AIRWAYS	NATIONAL AIRLINES	SOUTHWEST AIRWAYS
CAPITAL AIRLINES	NORTH CENTRAL AIRLINES	TRANS-TEXAS AIRWAYS
CENTRAL AIRLINES	NORTHEAST AIRLINES	TRANS-WORLD AIRLINES
CHICAGO & SOUTHERN AIR LINES	NORTHWEST AIRLINES	UNITED AIR LINES
COLONIAL AIRLINES	OZARK AIR LINES	U. S. AIRLINES
CONTINENTAL AIR LINES	PAN AMERICAN WORLD AIRWAYS	WEST COAST AIRLINES
DELTA AIR LINES	PIEDMONT AIRLINES	WESTERN AIR LINES

laundry and losing a good chance to learn and to display his abilities.

One of my men was up for promotion —he refused it because "the men might not like me as well." Instead of being busted to private for a remark like that the company officers just chuckled and back to the personality contest went the enlisted men.

Ex 1st Sgt.

Camp Hill, Pa.

Combat Engineers

To the Editors:

With reference to "What's Wrong with the Infantry," by Sergeant First Class Armored Infantryman in the January issue.

Some of his remarks are true and very real. Nevertheless, I think he slighted the Engineers when he said that personnel other than infantrymen should not get combat pay and that it lowers the infantryman's morale. On this particular part I wish to elaborate with grave emphasis.

From personal experience with the Combat Engineer, I would say his role in the modern army is much more important than the infantryman's. Often he has to precede the doughboy into enemy territory. His job is twofold: first he is an infantryman, then he is an engineer. As you can readily see, he is a professional technician as well as a fighting man. I should think the words "The Combat Engineer" should always be written so as to distinguish the breed from construction engineers, and that he is just as much entitled to combat pay as the infantryman. The artilleryman also plays an important role in combat. Often the opposing force can place deadly and accurate artillery into his position which leaves him exposed to a considerable degree.

Sergeant Augustus W. Owens
Hq. Co, 6th Inf Div
Fort Ord, Cal.

Sergeants Major

To the Editors:

Not too long ago, even in my time of service, when the word was passed that "The Sergeant Major is in the area," there was a great scramble to put things in order. The First Sergeant went slightly crazy. He and the company clerk would hurry to put all records in order. The Mess Sergeant also started moving. Out on the drill field the best instructors in the company, enlisted or commissioned, were put in charge of the training routine. No one was idle. It was the same with the guard mount. The guard would much rather have the Adjutant inspect than to have that old blankety-blank of a Sergeant Major do it. Even the regimental officers hated to see him because he was responsible to two persons: the adjutant, and the regimental commander!

Now, how things have changed! Comes the time to get a new Sergeant Major, do they pick the senior NCO in the outfit? They do not. "Let's use Corporal Smerk. He knows how to type, and he's up on the latest regulations." So we have a Sergeant Major who can't give a squad *right face*.

SFC R.C.M.

c/o PM,
San Francisco, Cal.

24th Division

To the Editor:

Could you tell me if it is or would be possible to issue me another membership card? Someone stole my wallet with my pass, ration card, membership card and other documents.

I have enjoyed every issue of our magazine. I have noticed some very good articles on the 24th Division in Korea. I was in this Division, serving in the 21st Infantry Regiment, under the leadership of Lt. Col. Charles B. Smith, when the Korea conflict began. I worked in Battalion S3 section and I got to know that he was a very fine and capable leader. What happened in the 4 July 1950 attack on us by the North Korean forces in our first battle in Korea proved Colonel Smith a splendid leader.

I returned to the United States on 26 September 1951 and reenlisted for six years and returned to Far East Command 3 October 1951. I am now with the 19th Infantry.

Cpl. Edgar S. Esplin
Co F, 19th Infantry
APO 24, c/o PM
San Francisco, Cal.

• We have mailed Corporal Esplin a new membership card.

To the Editors:

I was somewhat disturbed to read a news story in which it was revealed that the United States is fast losing ground on the cultural front in Japan.

The reason is that employees of the United States prefer attending cocktail parties (as many as five or six a week) to teaching occasional classes in English and democratic procedures to the Japanese who are pitifully eager to attend and learn. The inevitable consequence is that the whole program is falling apart, and we are muffing a beautiful chance to win friends we sorely need.

An excellent solution can be found in Army history. Following the Philippine Insurrection the first English language schools for the Filipinos were taught by Regular Army noncoms.

It requires no wild flight of the imagination to assume that enough reasonably literate GIs could be found in Korea to keep the cultural program in Japan alive. Just ask a few of them if they'd like to swap their M1s for grammar texts.

Captain William C. Robinson
The Madras Pioneer
Madras, Ore.

IMMEDIATE SAVINGS NOW

COMPLETE AUTO INSURANCE

Savings to 30%

IMMEDIATE SAVINGS UP TO . . . 30% . . . from prevailing board rates which apply in your territory can be YOURS on this complete, low cost Automobile Insurance Policy. GOVERNMENT SERVICES INSURANCE UNDERWRITERS can reduce costs to you because they deal direct with a highly selected and specialized class of policy holders. Protection against loss from bodily injury and property damage, liability . . . medical payments . . . accidental death . . . comprehensive personal liability . . . comprehensive fire and theft coverage. Covers collision damage to your car. Covers towing. Remember, once a policy holder, INSURANCE is always available to YOU! Former Army Men, who know your problems, will handle your policies in our office.

HOUSEHOLD CONTENTS FLOATER POLICY

This Floater Policy covers everything personal anywhere in the U. S. or abroad. It protects your household goods, clothing, uniforms, furniture, jewelry and valuable personal effects. Insures you against 14 named perils. Greatest coverage protection at lowest cost.

GOVERNMENT SERVICES INSURANCE UNDERWRITERS
(NOT AFFILIATED WITH U. S. GOVERNMENT)

MAIL THE COUPON FOR FULL DETAILS

GOVERNMENT SERVICES INSURANCE UNDERWRITERS 6
214 BROADWAY SAN ANTONIO, TEXAS

NAME .....

ADDRESS .....

AGE ..... RANK ..... MARRIED ..... SINGLE .....

CAR DESCRIPTION ..... ANNUAL MILEAGE .....

BUSINESS USE? ..... DRIVERS' AGES .....

2 GREAT POLICIES FOR PREFERRED ARMY PERSONNEL

Now... the famous MOTOR SCRAPER joins the A-C ALLIS-CHALMERS line

...the Finest Line on Earth

Allis-Chalmers has extended the *Finest Line on Earth* by adding the famous MOTOR SCRAPERS formerly manufactured by LaPlant-Choate. These customer-accepted earth movers meet A-C's 4-point quality requirements in every way.

DESIGNED FOR THE JOB . . . High horsepower to struck capacity ratio; large tires for greater flotation and traction; speeds up to 22 mph; easy loading; extra high apron lift for fast unloading.

BUILT TO TAKE IT . . . Self-adjusting clutch; constant mesh transmission; extra heavy-duty differential and drive axle; all-steel welded tractor main frame; line-bored gear case; large heavy-duty push block; tough pedestal hitch assembly.

EASY TO OPERATE . . . Full vision; adjustable foam rubber seat; easy-acting controls within convenient reach; all-weather starting; fast, safe hydraulic power steering.

EASY TO SERVICE . . . All moving parts are easy to reach, easy to service; all tires and wheels interchangeable.

With today's time-measured jobs demanding the most modern equipment, you can count on Allis-Chalmers MOTOR SCRAPERS, MOTOR WAGONS, tractors, motor graders and power units to meet these requirements. They are designed and built to provide top-notch performance and outstanding service life, and there is a complete line of Allied equipment to take full advantage of their power and versatility.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

"With Fortitude and Foresight"

IN his State of the Union Message on 2 February, President Eisenhower declared that his leadership would apply "American influence in world affairs with such fortitude and such foresight that it will deter aggression and eventually secure peace" and establish "a national administration of such integrity and efficiency that its honor at home will ensure respect abroad."

The direction this foreign policy and governmental administration will take, with special reference to the interests of military men, is outlined in the following paragraphs taken from the President's address.

Foreign Policy

OUR foreign policy must be clear, consistent and confident. . . . The policy we embrace must be a coherent global policy. . . . The policy we pursue will recognize the truth that no single country, even one so powerful as ours, can alone defend the liberty of all nations threatened by Communist aggression from without or subversion within.

OUR policy will be designed to foster the advent of practical unity in Western Europe. The nations of that region have contributed notably to the effort of sustaining the security of the free world. From the jungles of Indo-China and Malaya to the northern shores of Europe they have vastly improved their defensive strength. . . .

But the problem of security demands closer cooperation among the nations of Europe than has been known to date. Only a more closely integrated economic and political system can provide the greatly increased economic strength needed to maintain both necessary military readiness and respectable living standards. . . .

The needed unity of Western Europe manifestly cannot be manufactured from without; it can only be created from within. But it is right and necessary that we encourage Europe's leaders by informing them of the high value we place upon the earnestness of their efforts toward this goal.

Korea and the Far East

IN this general discussion of our foreign policy, I must make special mention of the war in Korea.

This war is, for Americans, the most painful phase of Communist aggression throughout the world. It is clearly a part of the same calculated assault that the aggressor is simultaneously pressing in Indo-China and in Malaya, and of the strategic situation that manifestly embraces the island of Formosa and the Chinese Nationalist forces there. The working out of

any military solution to the Korean War will inevitably affect all these areas.

The Administration is giving immediate increased attention to the development of additional Republic of Korea forces. The citizens of that country have proved their capacity as fighting men and their eagerness to take a greater share in the defense of their homeland. Organization and training will allow them to do so. Increased assistance to Korea for this purpose conforms fully to our global policies.

In June 1950, following the aggressive attack on the Republic of Korea, the United States Seventh Fleet was instructed both to prevent attack upon Formosa and also to insure that Formosa should not be used as a base of operations against the Chinese Communist mainland.

. . . there is no longer any logic or sense in a condition that required the United States Navy to assume defensive responsibilities on behalf of the Chinese Communists, thus permitting those Communists with greater impunity, to kill our soldiers and those of our United Nations allies, in Korea.

I am therefore, issuing instructions that the Seventh Fleet no longer be employed to shield Communist China. This order implies no aggressive intent on our part. . . .

Military Policy

OUR labor for peace in Korea and in the world imperatively demands the maintenance by the United States of a strong fighting service ready for any contingency.

Our problem is to achieve adequate military strength within the limits of endurable strain upon our economy. To amass military power without regard to our economic capacity would be to defend ourselves against one kind of disaster by inviting another.

Both military and economic objectives demand a single national military policy, proper coordination of our armed services, and effective consolidation of certain logistics functions.

We must eliminate waste and duplication of effort in the armed services.

We must realize clearly that size alone is not sufficient. The biggest force is not necessarily the best force—and we want the best.

We must not let traditions or habits of the past stand in the way of developing an efficient military force. All members of our forces must be ever mindful that they serve under a single flag and for a single cause.

We must effectively integrate our armament programs and plan them in such careful relation to our industrial facilities that we assure the best use of our manpower and our materials.

Because of the complex technical nature of our military organization and because of the security reasons involved, the Secretary of Defense must take the initiative and assume the responsibility for developing plans to give our nation maximum safety at minimum cost. Accordingly, the new Secretary of Defense and his civilian and military associates will, in the future, recommend such changes in present laws affecting our defense activities as may be necessary in order to clarify responsibilities and improve the total effectiveness of our defense effort.

This effort must always conform to policies laid down in the National Security Council.

The statutory function of the National Security Council is to assist the President in the formulation and coordination of significant domestic, foreign, and military policies required for the security of this nation. In these days of tension, it is essential that this central body have the vitality to perform effectively its statutory role. I propose to see that it does so.

WE must be strong in arms. We must be strong in the source of all our armament—our productivity. We all—workers and farmers, foremen and financiers, technicians and builders—all must produce, produce more, and produce yet more.

We must be strong, above all, in the spiritual resources upon which all else depends. . . .

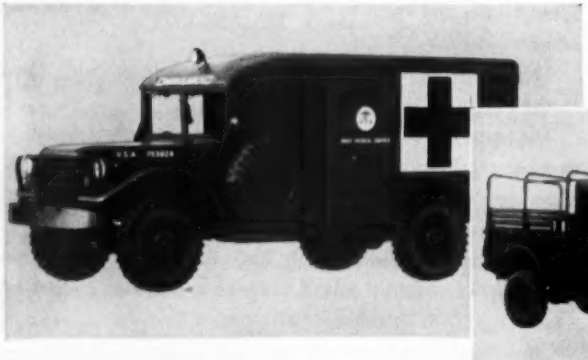
DODGE "Job-Rated" TRUCKS ARE BUILT FOR RUGGED FRONT-LINE ASSIGNMENTS

Army specialists and Dodge engineers teamed up in designing the trucks which Dodge supplies for military use in the front lines.

In building these vehicles Dodge has full appreciation of its responsibility to the fighting men who use them . . . knows that each unit must carry out its assignment without failure under the most rugged conditions.

So, you will find that exceptional *dependability* is built into every Dodge cargo carrier, ambulance, telephone maintenance truck.

You can be sure that Dodge, as a partner with the Army, is giving the men at the front the best equipment that can be built . . . trucks they can depend upon when the chips are down.



Dodge-built ambulance, ¾-ton, 4 x 4 unit. Dependability is an important reason why so many Dodge ambulances are given the assignment of evacuating the wounded from combat areas.

Dodge Cargo Carrier, sturdy ¾-ton, 4 x 4 unit for transporting materiel and personnel. Powerful and dependable, the Cargo Carrier is built to operate under toughest front-line conditions.

Cable Splicer and Telephone Installation and Maintenance Truck, another ¾-ton, 4 x 4 truck built by Dodge. Its job is installing and maintaining vital communications lines.

Right for the job . . . in peace or war

DODGE "Job-Rated" TRUCKS

THE TRUCK AND THE SOLDIER

Where is the Mobility?

THE ultimate measure of impedimenta is what it does for the combat soldier. Army trucks lay claim to two distinctions. They bring him his ammo and chow, and on occasion save his dogs. The soldier's complaint against the trucks, a consequence of "late chow" and "tired dogs," is that too often they do neither very well.

Much of the soldier's grudge against the truck is born of familiarity. "You'll break a leg getting in them and the ride will wreck your spinal column." It means little to him that trucks are the basis of the Army's mobility. The six-by-six is a clumsy piece of GI machinery, eternally crowding the roads, but usually in the service of someone else. If the soldier had his way he'd probably give every man a jeep.

The Army seems to want to do it better—or at least bigger. It has gone after mobility as though the ultimate was to provide a truck for every man—whether or not the man has a destination. The ratio of trucks to troops in World War II reached a figure approximately the same (one to five) as the per capita ownership of automobiles in the United States.

Still the soldier walked.

Private A. Kinback rested his SOP pound pack at bottleneck crossroads and watched the trucks roll by. All seemed in priority rush, going one way and another, but very few appeared to have loads. "They got an awful lot of trucks," observed A. Kinback. "Whose are they?"

"They're ours," snapped Sergeant Blow. "They support us. There are prime movers for the artillery, transporters for the tanks, vans for the shops, cargo trucks for the basic loads, ambulances for the wounded, jeeps for the important and the lucky, and wreckers to keep the others on the road."

Private A. Kinback kept the obvious question to himself and stretched out leisurely against his pack. "I think I'll just wait around for a bus, Sarge."

MOBILITY is one of those intangibles open to many interpretations. Someone has described it as "the ability to move by organic means" (in this sense, a man with two good feet). Someone else has described it as "the ability of a unit to move at one time" (this could mean two platoons on foot and the third in trucks). The regulations have clarified it as "the ability of a unit to move at one time by organic transport" (that is, everyone aboard a truck regardless of how fast or how far they're going). But the real implications of mobility depend on how you look at it.

Based on experience alone, the foot soldier would never guess that in the infantry division there is about one truck for every seven or eight men. Of the division's 2,500 vehicles, only a small portion are tanks and armored vehicles. One thousand are jeeps and another thousand are general-purpose trucks of the ¾- and 2½-ton varieties. Most of these vehicles have special tasks or assigned loads of ammunition and equipment so that comparatively few are used in troop hauling. When the division moves on its own, mustering every vehicle it has, at least one-third of the troops have to walk or wait for a shuttle. In this sense, so far as troop movements are concerned, the division is at best only about sixty-five per cent mobile.

Yet it requires only 270 additional motors (about one-tenth of division vehicle strength) to transport the troops who normally walk, and thus make the division completely mobile. In this sense, before adding the extra motors, the division is about ninety per cent mobile.

Practical G4s seldom plan on using vehicles for just one lift. Three trips per day are about minimum, and all the factors of time, distance, rate of movement and capacity for load are considered. Based on these variables it is possible for the division to move itself under most conditions, and within reasonable time limitations, without additional trucks. In this sense, based on average transportation factors alone, the division is more than one hundred per cent mobile.

So, depending on how you look at it, a division may be less than 65 per cent, approximately 90 per cent, or more than 100 per cent mobile. Of course, none of these is correct, for practical mobility is not so much how many trucks you have, but how well you use them. Not so much the size of your truck-

ing force, but its ability to deliver loads. Practical mobility, the dog-tired soldier will tell you, often approaches zero.

THERE'S a big gap between the low mobility which the soldier knows and the potential mobility which the planners claim. Where are these trucks?

Somewhere between division headquarters and the rifle company the trucks seem to get lost. Somewhere at about regiment they seem to get all tied up.

Every time a truck is running empty, every time it waits for a load, every time a shop truck becomes a stationary shop, every time a truck is concealed in bivouac, every time a prime mover waits for a gun to be towed, every time a vehicle is back for repair, every time a truck runs a message that could have been telephoned or radioed, every time the wheels stop rolling, valuable mobility is lost. In many cases this "waste" is predicated on military necessity—trucks must be available to move guns on a moment's notice, traveling shops and rolling dumps are often essential to quick movement, service and repair are required if vehicles are to be kept rolling. For practical purposes, however, these represent lost transport strength.

WE have, numerically, enough trucks. They just happen at times to be going when they should be coming; coming when they should be going. It's largely a matter of control. Or, as any good taxi dispatcher might put it, having the cabs on the spot when the calls come in.

There are those who will debate the merits of organic transport over centrally controlled transportation. There are those who will debate the other side of the issue. Both will be wrong. The solution to this, as in many things, lies in taking a balanced course. A simple formula can be provided: free the organic trucks to the organic needs; pool the service trucks for the common needs.

Every military unit should have enough, but no more transport than is required to fill its *constant* and *recurring* needs. Every major organization should have sufficient transport, pooled at the higher level, to meet emergency and peak load requirements wherever they may occur. The division has enough transportation to fill both requirements, and only the distribution would seem to require alteration.

One division G4 has a solution: "We should seriously examine the question of reorganizing the transport in the division. I believe this should be accomplished without adding to the over-all vehicle strength of the combat division.

"In my opinion we want a truck battalion of at least four companies. Although the vehicles for this unit would be obtained by drawing on excess motors in various division units, it would act to increase the over-all mobility in two ways: it would release critical regimental motors for troop movements and supply in forward areas; it would provide the command with a service pool of trucks to employ at the point of greatest demand.

"I have already provisionally organized my trucks, and I'm selling the idea of a 'Division Transportation Battalion' with all that the name implies.

"The General seems receptive . . ."

EVER since the motor vehicle replaced the horse and the escort wagon drawn by four mules, there has been conflict over whether we should concentrate on getting a better *horse* for tactical maneuver or a bigger *wagon* for transporting troops and supplies. Such an elemental problem need never have arisen had not the *horse* (the power unit) been inseparably bound to the *wagon* (the cargo body) with the adoption of the standard military truck.

"This comes from confusing horses with mules," says the old cavalry sergeant. Some of the same people who would never have thought of playing polo mounted on a mule, or of putting a pinto pony to an escort wagon, selected the 2½-ton, 6x6 truck as a compromise of the many military requirements, and as the solution to all the Army's transport needs.

This was, ostensibly, a victory for the *horse* people in that six drive wheels was quite a bit of horse, but 2½ tons was a mighty small wagonload. Nevertheless, the old work horse did pretty well in World War II and it got a lot of credit. It's still doing all right on the poor roadways of Korea, and we'll probably have it with us, in one model or another, for some time to come.

In checking up, however, we find that it never was really satisfactory in either its strictly tactical or its strictly supporting role. It fitted those borderline conditions represented by secondary roads in the near-rear, but as a terrain crawler up where the going got really tough, or as a highway runner along the MSRs, it wasn't everything to be desired by a long shot.

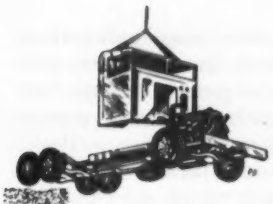
"It would seem," says the old cavalry sergeant, "that part of this problem could be met by separating the *horses* from the *mules*." Practical commercial truckers, schooled in competitive enterprise, learned long ago that the importance of the truck lies in its adaptability to a variety of uses. It would be inconceivable to them that a large trucking firm (the Army is the largest in the world) would use the same vehicle for passenger transport, for door-to-door package deliveries, and for long-distance hauling.

Final evaluation of any vehicle must be made on the basis of some measure of performance to weight. The great power and weight of the six-by-six, as compared to its miniature load capacity, has had far-reaching effects on military operations; effects which have tended to snowball theater logistical problems. For when load space is small you require more trucks to do a given job; more trucks mean increased traffic; increased traffic means faster road deterioration; this results in ever-growing demands for maintenance; all these add up to more personnel, more supplies to support those personnel, and more vehicles to carry those supplies . . . in a never-ending spiral.

"Perhaps," says the old cavalry sergeant, "this could be largely overcome by separating the *mules* from the *wagons*." Experienced commercial truckers discovered some time ago that for economy and effectiveness you couldn't beat the tractor-semitrailer combination. Not only does it provide a greater payload-to-vehicle-weight ratio, but unlimited variety and flexibility can be achieved in the disconnected semitrailer. The tractor, running free from a specific cargo body, can come and go, deliver a load and pick up another, make a run and be ready for a second, during the time one of its semitrailers is waiting for a load.

Military applications of the principle have long been known, but have been attempted only on a limited scale. Transportation heavy-truck companies (equipped with 5-ton tractors and 10-ton semitrailers) are able to relay loads forward with a speed and efficiency not equaled by the truck companies with 2½-ton trucks. But large-scale, rear-to-front use of tractor-trailers (such as was proposed in World War II to speed ammunition supply) was aborted by the apologists of the single standard straight truck.

What seems to be needed by the Army today is at least two separate standards—light and maneuverable off-road troop vehicles; fast and economical cargo tractor-trailers. To put it another way: less truck and proportionately more load space; fewer trucks, more road space and better trucking service.



WHERE ARE WE GOING?

Is our military vehicle program just going "round and round"?

Major Paul Hunt

I WONDER what has happened to the Army's good old standard automotive equipment. It looks like we are caught in a circle of changes with no definite goal in sight and no point from which to start correcting errors.

In 1945 several desirable goals were established. Now in 1953, we review the "progress" that's been made and wonder if the 1945 goals are still desirable or whether they have become a confused dream that would make even a Buck Rogers enthusiast scream for help.

Let's look at the record and see just where we are toward accomplishing our 1945 goals.

The first major problem was cross-country mobility. The major deterrents to mobility in our World War II wheeled vehicles were concluded to be high-pressure tires, slow on-the-spot waterproofing, and underpowered vehicles.

To simplify, let's consider the Army's 2½-ton cargo carrier. World War II GMCs were basically civilian trucks with some modifications for military use. These trucks were equipped with high-pressure tires because they were physically easy to handle, cheap, and very efficient. The truck could keep rolling even if one of a set of duals went flat. Then the idea of the low-pressure tire was raised and some were used on many old GMCs. This modification was not greeted with enthusiasm by users because they lost the valuable characteristics of the small tire, and had little apparent increase in cross-country mobility.

In 1950-51 when the interim vehicles appeared they had low-pressure tires. Again they proved unsatisfactory due to the reduction of space in the cargo bed, difficulty in handling, and lack of ability to keep rolling if one tire went flat. Now most of our wheeled vehicles in future production will be equipped once again with dual, high-pressure tires. "Around and around she goes and where she stops, nobody knows."

The World War II GMC truck could be waterproofed in 15 or 20 man-hours, using a kit. Then the Reo M34 was issued, completely waterproofed at the factory. Next, the GMC M135 came out. It requires the use of a kit, but still all units, such as the starter and distributor, were waterproofed at the factory. Now, we will accept vehicles that will be waterproofed with a kit very similar to that used with World War II vehicles. It begins to look like a game of "ring around the rosie."

INTERCHANGEABILITY of parts and accessories is another term dear to maintenance personnel. True enough, parts from the World War II GMC had little interchange with other trucks, such as the ¼- and ¾-ton trucks, but within the 2½-ton class, there was a good deal of interchange. Now look! We have the World War II GMC, the Reo, the Studebaker, and the GMC M135, plus present authority to use civilian type vehicles in many units, and all of these are within the 2½-ton cargo class. Has parts supply been simplified? Hardly.

There have been many comments and some little work accomplished to step up the power of our 2½-ton trucks. The World War II GMC had 104 horsepower, the GMC M135 has 145 horsepower. Now we all have seen the old GMC stuck but we also saw it tow a 105mm howitzer through South Pacific jungles, across Omaha Beach, through the Hürtgen Forest, and it kept rolling. We have not changed the weight of the 105mm howitzer, but the power plant has been increased by 41 hp. Why?

MAJOR PAUL HUNT, Artillery, is on the staff of the Department of Motors, The Artillery School, Fort Sill. Like all other articles in COMBAT FORCES JOURNAL (see contents page), this one does not necessarily reflect the opinions of the Department of Defense, the Department of the Army, the military organization of which the author is a member, the Association of the U. S. Army, or the editors of COMBAT FORCES JOURNAL.

Ease of maintenance is a cry that has gone up every time anyone starts to outline vehicle characteristics. Have we accomplished much along that line in the last ten years? Let's look again at the new GMC M135 and see if it is easy to maintain:

To remove a spark plug takes a special wrench. If you want to check ignition timing, you must have special adapters for your testing equipment. If the breaker points in the distributor need replacing, you replace the complete distributor and coil assembly. Trouble-shooting is a slow, difficult procedure because every connection is a sealed, waterproofed unit. Does all of this spell ease of maintenance?

In this piece, I have tried to stay away from our more complex vehicles, such as cargo tractors, self-propelled artillery pieces, and tanks, because the questions become even more confusing about them.

I have steered clear of the cost problem as much as possible because there we must consider labor cost, material cost and inflation.

I just wonder whether our goal for automotive equipment is very clear. Few of these questions are new. There is undoubtedly a clear-cut answer for each of them, but many soldiers are asking: "Just where are we going?"

One Answer to "Where Are We Going" Is

HOW DO WE ROLL?

Lieutenant Colonel John H. Davis

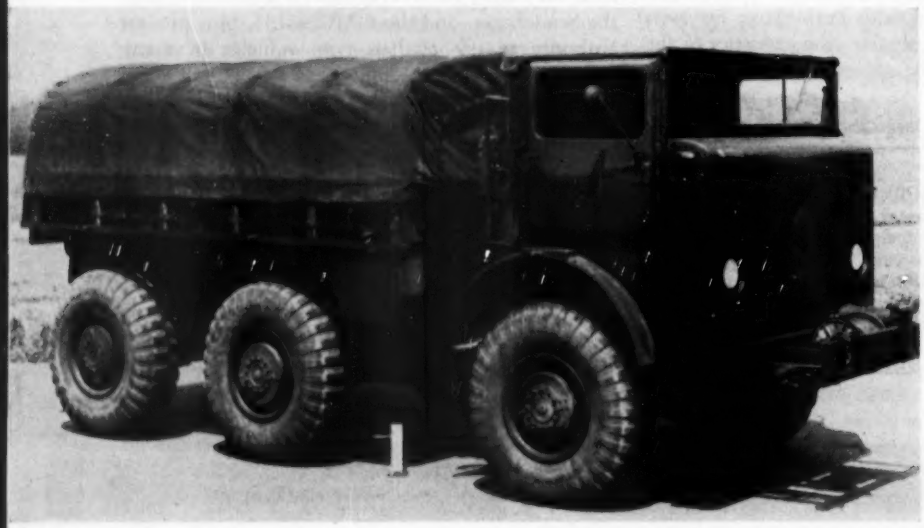
AT the end of World War II there was a strong sentiment in the Army for extremely mobile, versatile wheeled transport vehicles of revolutionary design. Research and development went to work and the results were vehicles with wondrous go-ability. They were called Cross Country Carriers and lived up to the name. They were as easy to ride in as the Sante Fe Chief, they had the go qualities of a mule, high axle clearance, phenomenal sealed brakes that ignored dust, mud and salt water, and speed and power comparable to the latest motor cars. These superlative land transports (you can't call them trucks) were a delight to motor sergeants. And infantrymen (who know all there is to know about riding in trucks) found them to their liking.

To round out this story we must know what was going on in the realm of trucks for the ZI and ComZ. It was thought by many that the complication and extra cost of all-wheel drive and other features considered peculiar to tactical trucks might be unnecessary in the Communications Zone or Zone of Interior and that in those areas commercial or semi-tactical trucks could be used.

Now you can see the emergence of a pattern: Cross Country Carriers for the tactical units and a watered-down tactical truck for everyone else.

LT. COL. JOHN H. DAVIS, Ordnance Corps, is on duty in the Office of the Chief of Ordnance.

Cross Country Carrier, 2½ ton, 6x6, T-51



If the CCCs (I'll call the Cross Country Carriers that to save space) were so good and the rear area needs were such that the gleaming beauties fresh from Detroit could fill the bill, everything was hunky-dory. But was it?

WE know that the United Nations forces in Korea are not blessed with CCCs. In June of 1950 our plans had to be speeded up to meet a very real shooting conflict and the potential threat of a great war. But even before this emergency it was becoming apparent that the combination of Cross Country Carrier and non-tactical motor trucks was not exactly the last word. Several things were out of kilter.

For one thing, the Cross Country Carriers were so good they cost too much. Partly because they ate up critical materials such as aluminum-copper-molybdenum in quantities and required many man-hours of high-priced labor to machine and assemble them.

Also it turned out to be untrue that all-wheel drive is unnecessary in the average communications zone. In an *ideal* ComZ our highways would be paved and kept in perfect repair at all times. It would never snow and enemy air would never mess up our routes with bombs. And ComZ would never have to furnish vehicles to tactical units in forward areas.

But the real hard facts are that while ComZ vehicles may not need all-wheel drive or tactical features more than a few times in a life of routine hauling but when they are needed the need is real and earnest. For want of a nail . . .

It is for a very good reason that the mission is always stated in the estimate of the situation, re-stated in the intelligence estimate, and is a vital part of the operations order. The mission of a Communications Zone must transcend all other considerations. Support of forward units must be assured.

Is all this an answer to the question of whether today's wheeled vehicles meet our needs and are the best we can do at this time? In part it is. The Cross Country Carriers did meet their design goal; they proved to be outstanding in performance but we could not accept the penalties of high cost and critical materials.

The elimination of the Cross Country Carrier had to be followed with something realistic and possible. This became increasingly more important because of Korea and the obsolescence of war-weary trucks of 1941-45. New goals of design had to be set. A basis was established with the following criteria: reliability, produceability, mobility, cost and supportability.

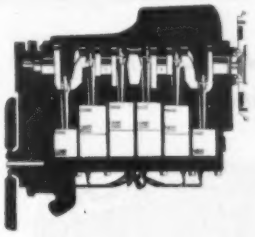
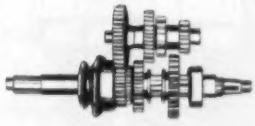
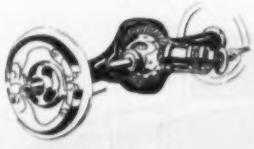
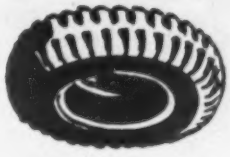
These five baselines for vehicle construction are not unlike the ones used in creating the Cross Country Carriers, but the emphasis was different. Let's see where and how.

Reliability, or dependability, were just as desirable in the Cross Country Carriers as in our present cargo trucks. A high tensile alloy can give structural integrity to a highly stressed part or an unusual design can be used—torsion bar suspension, for example. Thus, the reliability could be built-in. But in a tactical vehicle which at least tends to assume the basic configuration of conventional trucks, this reliability or "failure to fail" can be obtained by what we call "overdesign." The degree of overdesign is a result of engineering computations as applied to tactical maneuvers in various types of terrain and with varying loads. It is often said that a design that gives us more capability than the vehicle demands, creates a waste which, when multiplied by the number we produce, becomes a drain on the national economy. This like almost any other similar statement is compounded of both truth and buncombe. If a group of our most eminent vehicle designers were told to create a truck whose load capability would be no greater than three tons, and with clearly defined speed, mobility and other characteristics, there would be a fair degree of unanimity in their approach. But suppose that many of the design assumptions were as intangible as "average cross-country operation." Maximum load would be put at three tons but in an emergency the load would be all that could be piled on. Actually tactical vehicles put into mass production get their final design from test operations by Ordnance and the various Army Field Forces boards. These tests reach a compromise as to how much "overdesign" shall be included. Frequently a few relatively minor changes will greatly enhance the capability of a piece of automotive equipment. But a most important point is that when such a change is made the ability of the truck to perform reliably at lesser loads or conditions is vastly increased.

Is *produceability* an important factor? We all like to think that U.S. production is so vast that it can produce virtually any quantity of anything. In reality the old bottleneck of machine tools is always a compelling factor. Here again if we examine the case of the Cross Country Carriers versus tactical cargo trucks, we see that our capability of producing large quantities of CCCs just didn't exist in 1950 and to get the trucks we had to have quickly we had to turn to the factories already tooled up to manufacture something usable.

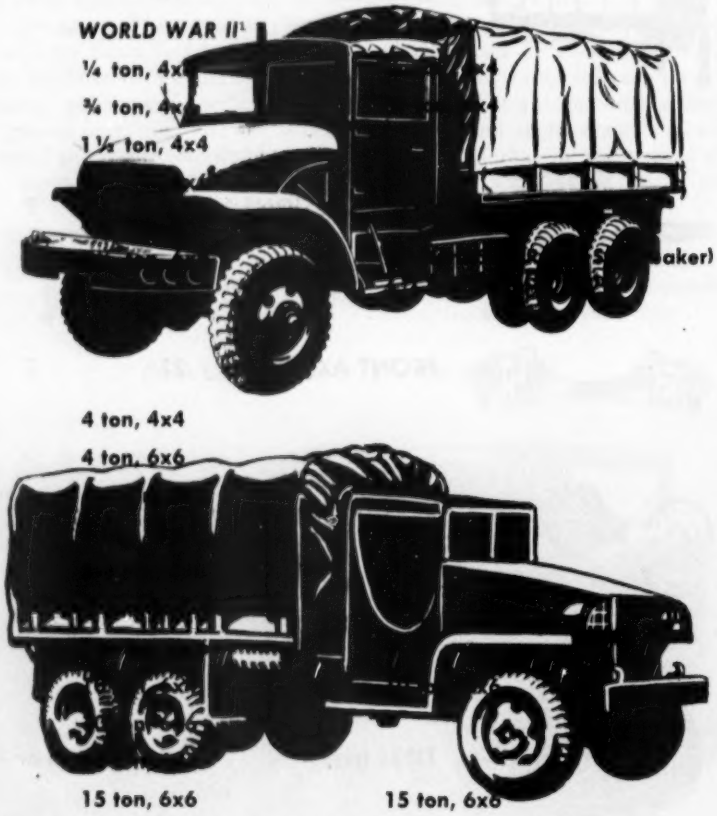
It is just as obvious that the trends will be reflected in future tactical vehicles. Already one 2½-ton, 6x6 truck has automatic transmission while the

HOW THE MAJOR COMPONENTS OF THE ARMY'S WHEELED VEHICLES HAVE BEEN STANDARDIZED

	Components	World War II	Today
	ENGINES	18	7
	TRANSMISSIONS	19	7
	FRONT AXLES	21	7
	REAR AXLES	16	7
	TIRES (sizes)	13	6 or 7

Truck, cargo, 2½ ton, 6x6, XM-211—with hydramatic transmission

HOW THE NUMBER OF "BASIC VEHICLES" IN THE ARMY'S WHEELED VEHICLE FLEET HAS BEEN REDUCED



[1]This is an arbitrary listing of "basic vehicles" of World War II vintage. At least one Ordnance Corps' chart lists 28 "basic vehicles."

5-ton, 6x6 trucks all have power steering. It is entirely probable that in a few years the inclusion of a conventional sliding gear transmission in a tactical truck might require extensive tooling that would place it beyond our reach. This doesn't mean that we would be unable to produce such special material. Given the time (which we won't have) and the priority (which probably will go elsewhere) these world of tomorrow vehicles could be produced today.

Mobility was the cardinal principle of the Cross Country Carrier. No compromises were accepted that would reduce that characteristic. High-flotation single tires were used to get it through mud and over bad terrain. The tire sizes and suspension were so contrived to provide lots of clearance under the vehicle. Independent suspension with torsion bar springing helped to give the clearance. Cabs were over engines to shorten truck lengths so that airborne movement was improved as that too is a part of mobility. Powerful engines drove into automatic transmissions to provide the brilliant performance that is always a basic element of mobility. As the fleet of new tactical cargo trucks was developed it was inevitable that the experience of builders, designers and users of Cross Country Carriers was applied in part.

An example was the use of single tires on the 2½-ton and 5-ton trucks when they were first produced. Then as production continued and user experience was gained it was decided that dual tires did not reduce mobility enough to counter the gain that they provided in cargo space, convenience and reduction in roadside tire changes. So the trucks were equipped with dual tires whose inherent cross-country ability is less, according to many authorities, than single tires. But it must be conceded that dual tires put more rubber on the ground than singles and thus reduce ground pressure. Such high cross-country speeds as the Cross Country Carriers could achieve were seldom if ever used so it became possible to use engines of lower horsepower and still get a good level of performance.

Mobility also includes certain conveniences, such as fording ability, quick-starting help, and other devices. Recall that we said that ComZ trucks probably didn't need all of the features of tactical trucks? Well, these are some of the features they can do without. But since a manufacturer can't foresee where a truck is going, nor can the average depot, it surely isn't practical to provide trucks from the production line both with and without these devices since it

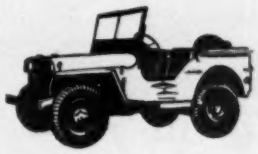
would cost nearly as much to keep them off a truck as to put them on. However, they are available in kits and their installation is not difficult. So it seems that we have actually compromised our mobility to a certain extent. The real point to consider is whether the tactical ability of combat units has been reduced seriously. And further, whether it is better to have a truck with less go-ability or to be entitled to (but not have) the last word in wheeled vehicles.

Cost was mentioned before as being primarily a consideration of man-hours rather than materials or dollars. Production capability and cost are very closely interwoven. The need for special and/or additional machine tools can be reckoned as a need for man-hours of the most critical type at a most inappropriate time. This consideration only serves to emphasize that it frequently becomes a question of which shall we have: fancy trimmings and few trucks or large number of trucks now.

The last element in the design criteria was *supportability*. This is a term dreamed up to include ease of maintenance, reduction of the time the truck is in the shop, and minimum needs for parts. Maybe it ought to be called *maintainability*. A truck that breaks down constantly has no reliability. Here again the Cross Country Carriers provided invaluable data from a standpoint of support. They were carefully engineered to provide easy, simple maintenance or lack of a need for maintenance, which is still better. Much of what was learned on these vehicles was applied to our present trucks. All of the new trucks ride good. A pretty strong statement, but true. Ride in a ¼-ton truck M38A1 (jeep to you) and see how much more comfortable it is than the old MB or GPW series of jeeps. The incidence of "sacro-iliacitis" is ging down.

Did we meet our design goals in the trucks we have now? Partly. We compromised some goals to make them fit the bounds of economy and production and yet meet our needs. If you ask of what value were the Cross Country Carriers if our present vehicles meet the need, let me tell you what the Cross Country Carriers contributed. Many of developments in the Cross Country Carriers show up in the present trucks. Items too costly for our new cargo trucks are still being examined and tested with the hope that its cost may come down so we can afford it. As I mentioned earlier what is unusual and costly now may become available and necessary before long. When that happens we must be prepared to make the change.

A CONDENSED LISTING OF BODY TYPES



Utility Trucks

Cargo Personnel (¼ ton)
Command (¾ ton)
Panel (¾ to 1½ ton)
Carry-all (¾ ton)

Van Trucks

Cargo (2½ to 10 ton)
Shop (2½ to 5 ton)
Medical (2½ ton)
Expansible (2½ to 5 ton)

Dump Trucks **(2 to 15 ton)**

Truck Tractors **(1½ to 15 ton)**

Wrecker Trucks

Crane Trucks

Ambulances

Front line (¼ to ¾ ton)
Field (¾ ton)

Tank Trucks

Fuel (1½ to 10 ton)
Water (2½ ton)

Maintenance Trucks

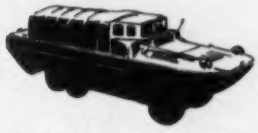
Telephone (¾ to 2½ ton)
Light Maintenance (¾ ton)

Cargo Trucks

Weapons carrier (¾ ton)

Cargo Personnel (¾ to 2½ ton)

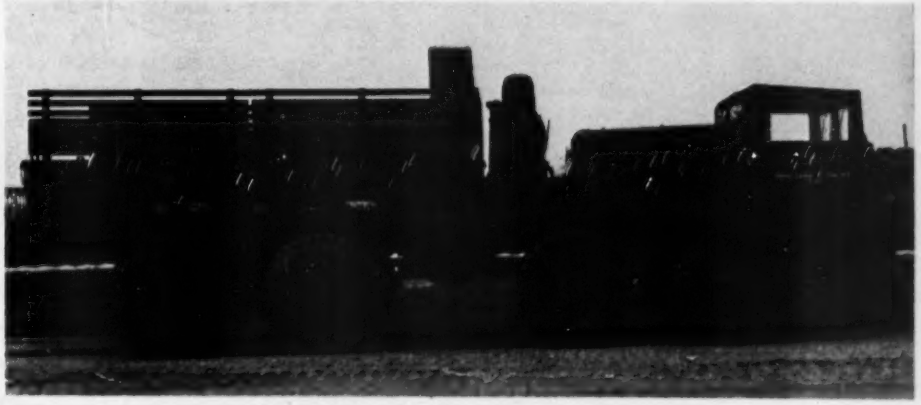
Cargo Prime Mover (1½ to 10 ton)
Long (std) (1½ to 10 ton)
Extra long (1½ to 10 ton)



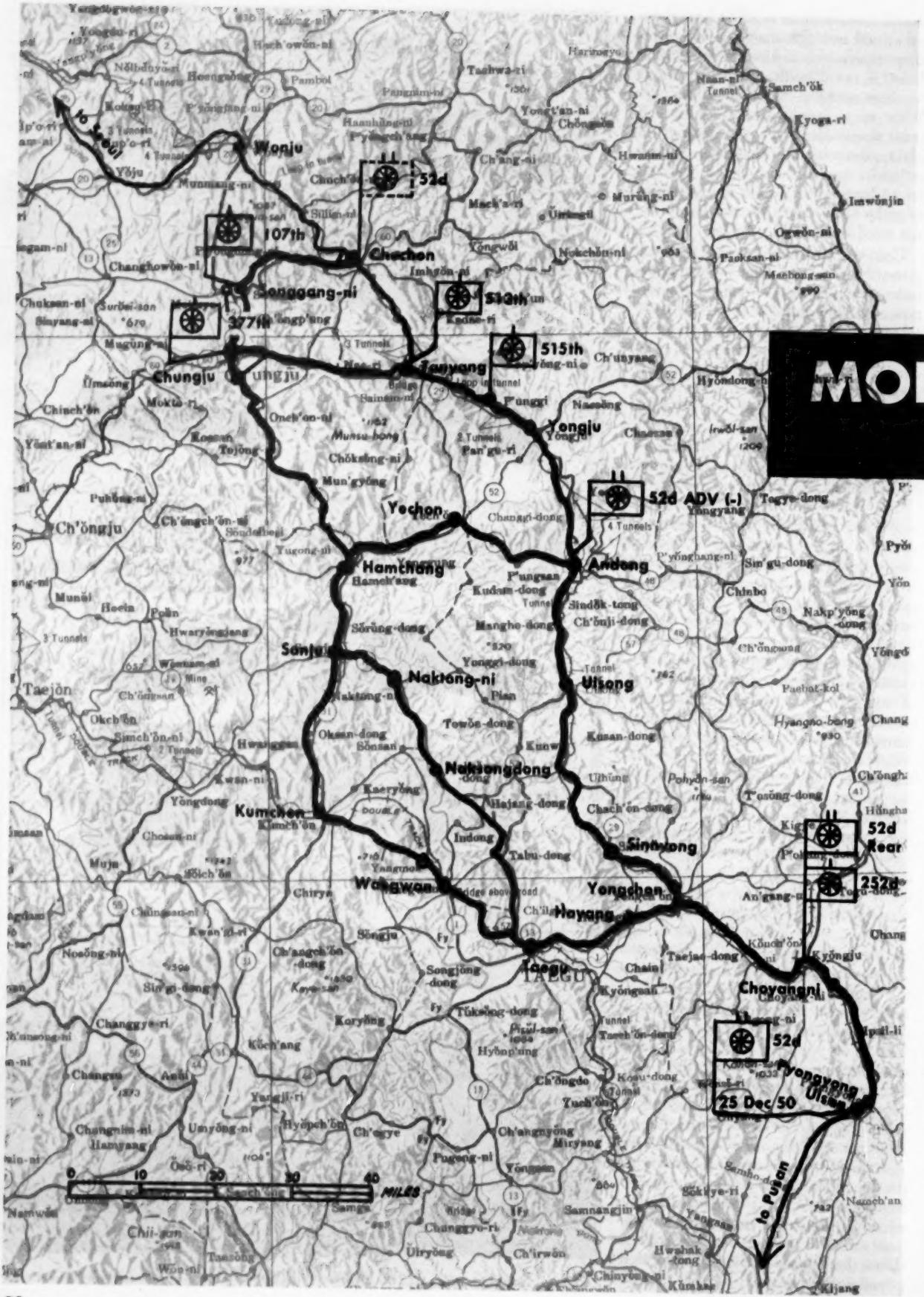
Amphibious Trucks **(¼ to 10 ton)**

Chassis Types (as required)
Standard wheel base
Long wheel base
Extra long wheel base
Single and dual tires

Special Purpose Trucks
All types; as required by using services



Truck, cargo, 10 ton, 8x8, T-57


To Seoul
Wonju
107th
Chechon
52d
Songgang-ni
187th
313th
515th
Chungju
Yonyang
Yongju
52d ADV (-)
Yechon
Andong
Hamchang
Sanju
Naktong-ni
Uisong
Naksongdong
Kumchon
Waegwan
Sinnyong
Yongchon
Hayang
Taegu
52d Rear
252d
Chayangni
52d
Pyongyang
Ulsan
25 Dec 50
To Pusan
0 10 20 30 40 MILES

A Transportation truck company moves combat troops from the beachhead to the front. Below: *Maintenance check point of the 42d Transportation Truck Company.*

B .E MAINTENANCE MADE 'EM ROLL

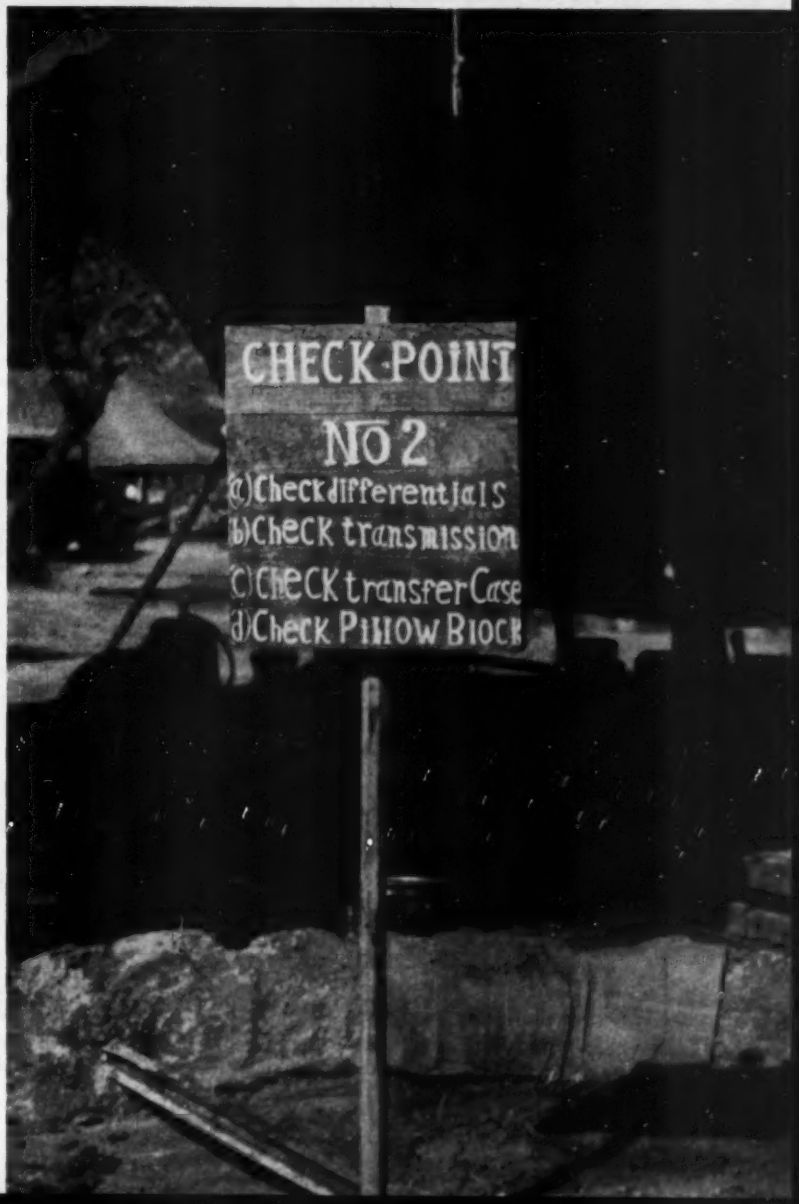
How one outfit in Korea kept their trucks going

Lt. Col. Waldon C. Winston

ON 1 January 1951, the 52d Transportation Truck Battalion in Korea was engaged in an around-the-clock operation that didn't permit any but essential repairs and major overhauls. Time and space factors hadn't exactly favored monthly maintenance and 6,000-mile checks during the four months the 52d had been in Korea. Furthermore, when we came out of North Korea our vehicles were battered from a half dozen dock and beach loadings and unloadings.

With temperatures around 20 degrees Fahrenheit, there was an inclination to disregard good maintenance practices. However, it was gratifying to read in the reports of company and platoon officers of the truck companies of how they kept up their daily maintenance and brought their trucks out of Hagaru and Hoto-ri. They didn't lack pride in their equipment, but spare parts shortage and exhausting hours at the wheel were reflected in the overall conditions of the trucks.

All three of the Battalion's companies (377th, 513th, and 515th Transportation Truck Companies) were on the road on New Year's Eve when the Communists threatened in the vicinity of Wonju. All-night driving from Ulsan was necessary to make contact with the 7th Infantry Division unit which we were to move shortly after daylight. Drivers had to eat their New Year's turkey on the run. (I required one unit to feed their drivers from a roster as they reported back from each turn-around to make sure that each man got his New Year's turkey.) I got back to my own rear CP only four times in the next 30 days.



LIEUTENANT COLONEL WALDON C. WINSTON, Infantry, commanded the 52d Transportation Truck Battalion in Korea for many months. He is now on duty in California.

An MP points the way for a jeep coming out of the combat zone.

We hauled the 7th Infantry Division from the Yongchon-Hayang-Sinnyong vicinity to the Yongju-Tanyang-Chechon area and left them while we returned for additional loads. Later on, as General Ridgway's "Operation Killer" got under way, we hauled ammunition from Yongchon to the gun positions in Wonju. Because of congested road conditions, our turn-around covered about 300 miles (see sketch) with a few side trips thrown in. Our return was a non-stop trip over icy mountainous passes and traffic-congested narrow roads. On the first trip we left Chechon at 0800 and drove continuously except for forced halts at check points in the Hamchang Pass until 0200 the next morning. Drivers were rotated, the trucks were refueled and checked, and a few hours later they repeated the turn-around to Chechon, with a night trip non-stop on their return which detoured them from Hamchang-Yechon-Andong and back to Yongchon.

The continual demands on the Battalion's vehicles increased our maintenance problems. A disabled truck might be 150-170 miles away from homebase, alone, and with little assistance in sight.

An experience a few months earlier, while we were still at Inchon, suggested a solution. Corporal Carl H. Kimbrall was driving the battalion wrecker when he came upon a disabled truck belonging to one of my companies. He arranged a double-tow consisting of the disabled truck and the welding trailer he was towing. With this 40-foot trailer job, Kimbrall drove 170 miles, wheeling his rig around tight U-turns, over narrow mountainous roads, over rickety bridges and through deep river fords to bring the crippled vehicle safely home. This experience fathered a policy designed to save trucks and time. I directed that if a truck became disabled, the next truck following would tow it to the next unit, no matter what the distance. No truck of the 52d would be left out overnight.

Once when a 6x6, loaded with ammunition, was disabled at the approach to the bombed-out Andong bridge, I commandeered a 7th Infantry Division Ordnance wrecker and had the disabled truck towed forward to Yongju. There we found that repair parts were unavailable. My friend, Lieutenant Colonel Paul Oswald, G4 of the 7th Division, warned Ordnance not to tow the disabled truck any farther. I asked him what he would do about the ammunition. It would have to be unloaded, he said; you don't tow disabled vehicles forward. I agreed with that, but I thought the ammunition should go forward no matter what happened to the truck.

"I'll take the truck off your hands on the other side of the mountain, if your wrecker can get it through the Tanyang Pass," I told him. This was unorthodox, to be sure, but traffic here was one way —forward—and I had no idea when we could evacuate the truck if we left it behind.

The wrecker driver must have had a hell of a time towing that disabled truck across the hazardous mountain pass to Tanyang, but he delivered it. A few hours later the small detachment I had there salvaged a part from another wreck and put the truck in operation. Most important of all—when the enemy attacked Tanyang that night, the 7th Division unit in Tanyang used the ammunition that had been towed across the mountain in the disabled truck.

DURING this period X Corps was leapfrogging forward, but Lieutenant General Edward M. Almond kept his rear CP at Kyongju. For purposes of control, it was necessary for us to keep a detachment at each end of the line and at key points in between. Meanwhile each truck company was finding it more and more difficult to keep going. Running repairs and deadlined disabled vehicles were cutting the battalion's effectiveness. The battalion maintenance section was with the rear echelon and was doing very little business.

An accumulation of disabled vehicles up front could become so involved that our support of front-line units would fall down. At the time we had companies scattered all over Southeast Korea, as shown on the sketch. My most forward company was 170 miles ahead of the company at Corps' rear. The maintenance situation called for aggressive action but without interference of the support mission.

By scrounging, begging and borrowing, it was possible to keep trucks from being deadlined very long, except in cases of a major overhaul. On one occasion, we obtained an engine from the 7th Division Ordnance at Yongju, hauled it across the mountains where company mechanics installed it. Harassed company motor officers had nightmares as they struggled to keep vehicles operational. It became as impractical to evacuate vehicles to the rear as it was unorthodox to tow them forward. And they couldn't be left along the MSR awaiting assistance.

I believe that the job of the battalion maintenance section is to support attached units, no matter where they are. So as a field expedient, I put my battalion maintenance section on a "mobile" assignment. It did not operate as a roving maintenance detail making roadside repairs because the problem was bigger than that. Since the vehicles couldn't be evacuated, I sent direct maintenance to the units. The maintenance tent would set up in a company area and battalion mechanics helped perform monthly maintenance checks, working with company mechanics until they got the company back on schedule.

The Inspection Team (provided by the T/O) accompanied the Mobile

Team and performed Stateside type inspection.

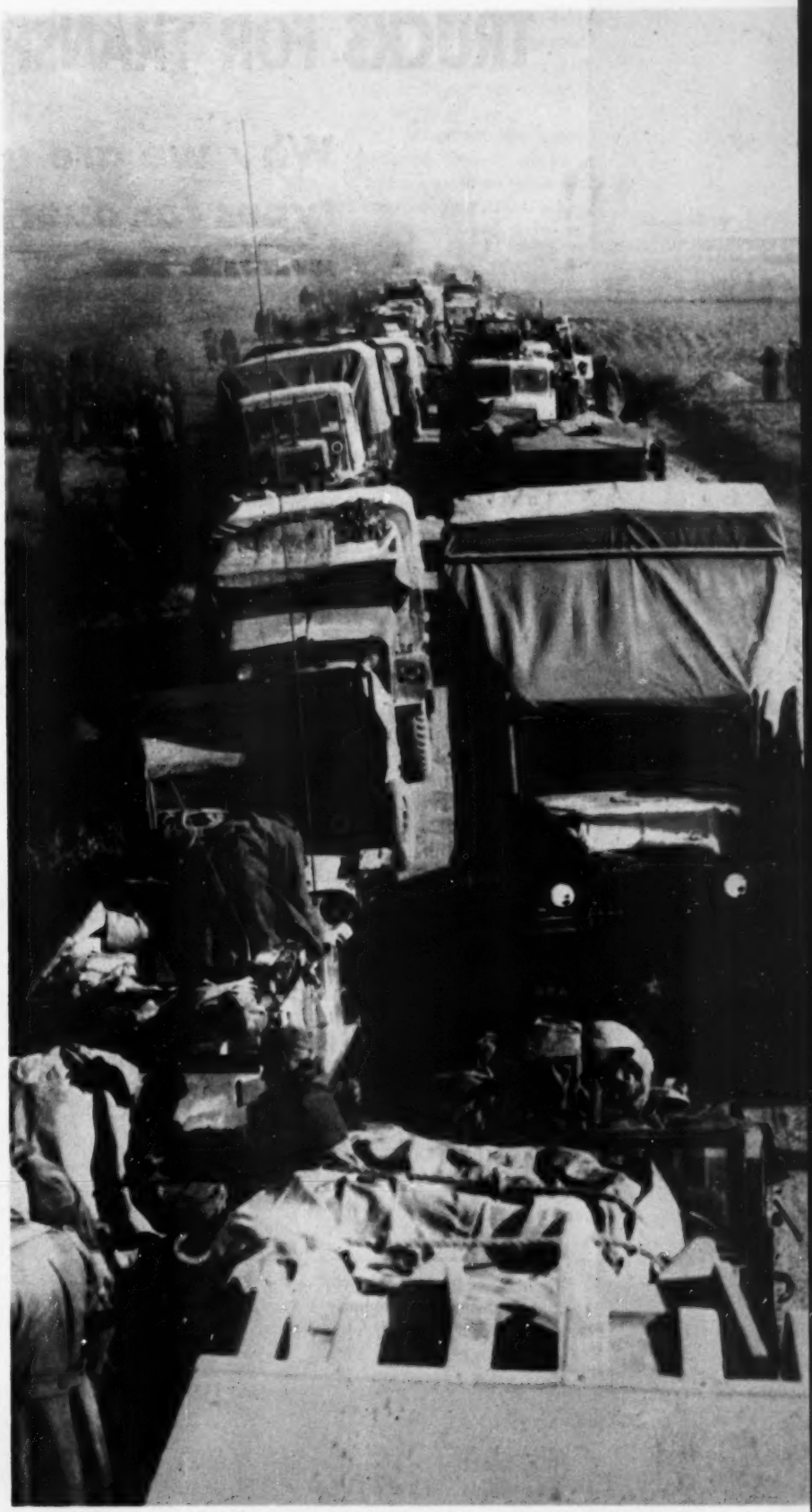
Like the early circuit-rider administering to his flock, our mobile maintenance team moved from one unit to another. It would "leapfrog" between units and help get trucks off the deadline.

THE way to use the maintenance section of the Transportation Truck Battalion, organized under T/O&E 55-16, in combat, challenged us on several occasions in Korea. Certainly, the maintenance personnel were subjected to numerous trial and error experiments, some of which were inconclusive. However, we accomplished our weekly and monthly preventive maintenance checks according to Stateside schedules and gave our morale quite a boost at the same time. We wouldn't admit that we couldn't perform our assigned maintenance functions.

Preventive maintenance always is reflected in the operational efficiency of a unit. Any unit operating around the clock will always have some vehicles on deadline. But when battalion headquarters moved to Checon and all companies were assembled in that area in March 1951 each company was able to perform its own monthly services while battalion maintenance performed its usual semi-annual (6,000-mile) checks. During March thirty-six semi-annual checks were completed without deadlining a single vehicle for lack of parts. This was possible because of close proximity of EUSAK supporting Ordnance and authority to remove necessary parts from salvaged vehicles at the Ordnance collecting point.

The performance of the 52d Transportation Truck Battalion during the period January-February-March 1951 is a compliment to its maintenance personnel who improved the overall maintenance, while the battalion was hauling a heavy tonnage of cargo. Its March tonnage was two and one half times that hauled in January. Total driven miles in March were nearly 400,000, an increase of approximately 60,000 driven miles over January. (During the three-month period, units of the 52d had rolled up in excess of a million driven miles.) It was mobile maintenance that made 'em roll!

Our methods were not a deviation from the school solution, but just another application of the SOP that the senior commander is responsible for proper maintenance of equipment. He must be alert for indications of any deficiencies and be prepared to devise methods to overcome them.



Sometimes the roads become jammed, as in this photograph shot in the early months of the Korean war when retrogade movements were not uncommon.

TRUCKS FOR TRANSPORT

Why we are using commercial types for over-the-road hauling

Colonel Ernest A. Suttles

THE motor vehicle is a weapon—like the rifle it is made to deliver a projectile. As with other weapons it comes in different sizes and calibers: some are for close-in tactical use; others are made to deliver heavier stuff at long range.

This distinction in arms is well understood; in motor transportation it has not always been so clear. Most military vehicles—the jeep, the weapons carrier, the six-by-six—are tactical weapons built for tough going over difficult terrain. Their use for logistical jobs requiring the delivery of tremendous tonnages over great distances is like using infantry mortars when the situation calls for heavy howitzers.

Yet, this is exactly what we've done in the past. Fortunately in World War II we were able to make up in mass what we lacked in transport economy. The Red Ball Express, while setting new standards for logistical achievement, became a turning point.

Behind the lightning-like advances of Bradley's three armies, the truck convoys of the Motor Transport Service rolled relentlessly day and night to keep the supplies moving. A frequently recurring pattern of military operations gave rise to the need for the service. The mobility of armies had been based almost entirely on tactical vehicles in the hands of using troops. In the conquest of enemy territory combat troops could move fast and far, but there remained an ever-widening gap between them and their base of supply.

In meeting these conditions the Motor Transport Service sought to apply principles as old as warfare in putting to use equipment and practices as modern as America's highway transportation industry.

MOBILITY—the principle of war most closely associated with an army's ability to achieve victory —consists of a number of things. It includes *maneuverability*, the ability to negotiate terrain; *range*, the ability to travel far; *speed*, the ability to move quickly; and *capacity*, the ability to carry a maximum load. Only automotive transport has that combination of maneuverability, range, speed and carrying capacity essential to the many needs of the modern army. But this cannot be achieved in a single type of equipment, nor can it always be achieved by mounting different bodies on a single standard chassis. One type of equipment may have excellent maneuverability for off-road going; another may have speed and cargo capacity but be restricted to improved roads; and another may have range and speed but be limited to passenger or other service. Flexibility can best be accomplished by a number of types, each designed for specific functional purposes.

With the exception of tactical types, commercial industry has developed vehicles suitable for every military transport need. These vehicles roll off assembly lines pre-tooled for any emergency and are tested and improved every day in the tough commercial market. The Motor Transport Service turned to industry because it recognized in the military situations parallels that had already been met by the automotive and highway specialists of America. It saw in its car companies a parallel with the taxi-fleets of cities; in its truck companies a parallel with the large motor carriers; in its administrative fleet of buses a parallel with the services of transit firms; in its supplemental units a parallel with public highway and traffic agencies.

To speed its wartime operations, the service was assigned routes for its own use, from which refugee and other traffic was excluded, and over which truck convoys could be dispatched at high speed on exact schedules. Along these express routes check points were set up in direct communication with a traffic headquarters and the entire system was controlled in a manner similar to that of a modern railroad but with unlimited flexibility in adjusting to tactical change.

Making more efficient use of the vehicles on hand, the service got permission to load tactical

COLONEL ERNEST A. SUTTLES, Transportation Corps, is Chief of the Highway Transport Service Division of the Office of the Chief of Transportation.

A convoy of motor vehicles forms up at Pusan to move north towards the lines where short-handed and short-supplied UN troops were fighting in July 1950.

vehicles above their off-road capacities when used on highways. For example, the standard 2½-ton cargo truck was allowed loads up to five tons when put to highway use.

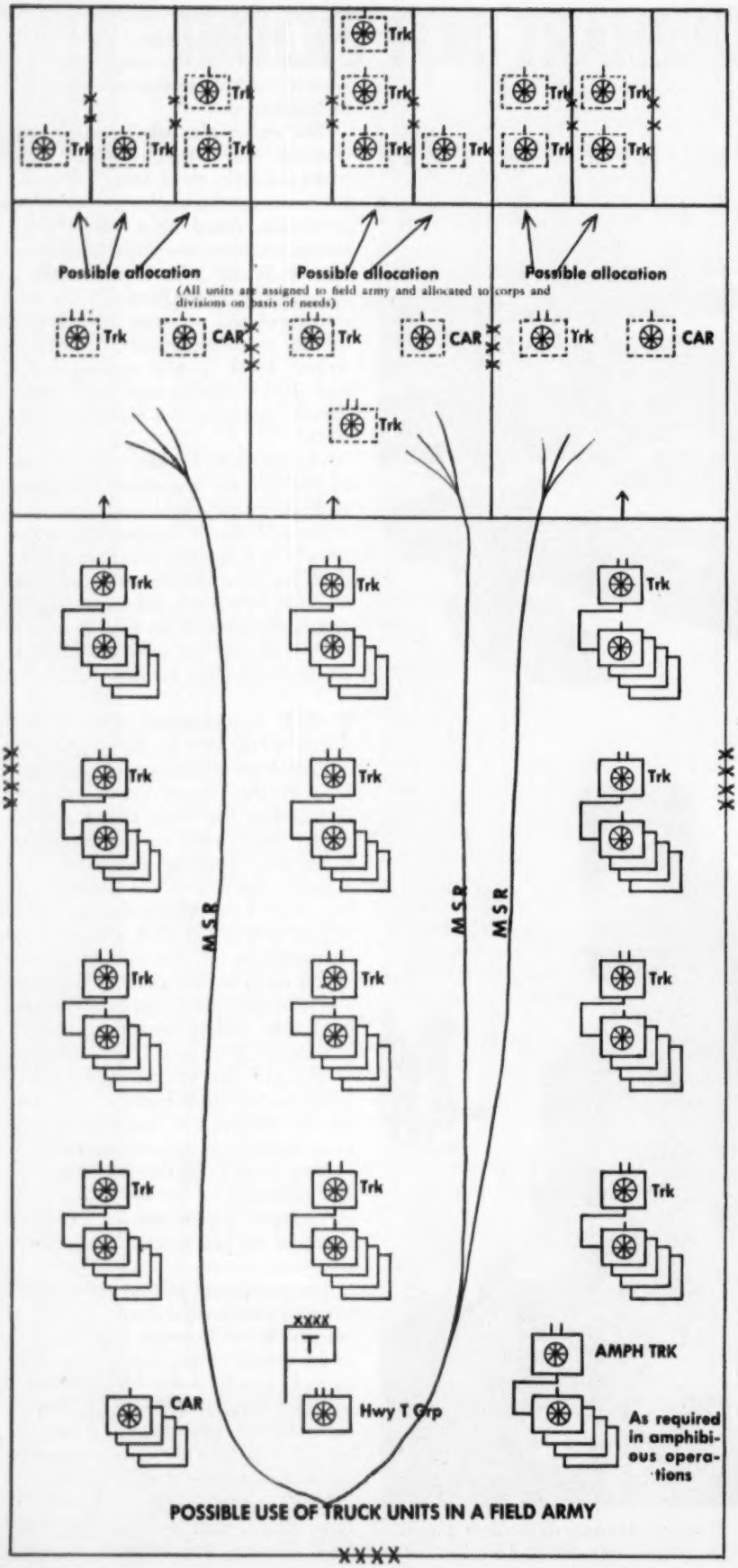
The service also asked for and later received heavy tractor-semitrailer vehicles similar to those found so successful in commercial trucking. The 10-ton semitrailer, towed by a 4-5-ton truck-tractor, was extensively used in the latter part of World War II and again in connection with the Berlin Airlift. This equipment and proposed heavier types opened unlimited possibilities for increased loads, greatly expanded line haul services and allowed drastic reductions in personnel and operating equipment.

The service further selected and adapted to its operations commercial methods which would assure the most economical use of equipment and personnel—such measures as rotating driver shifts on an around-the-clock schedule, return load programs, individual dispatch and shuttle methods for local hauls, and trailer exchange and relay procedures in accomplishing line hauls.

THESE improvements did not end with World War II. Faced with serious problems of economy at the beginning of the present period of semi-mobilization the Army looked to even greater dependence on commercial vehicles and operating procedures. For example, the cost of the 2½-ton truck had risen from $2700 during World War II to $7200 in 1950. The principal characteristics of the tactical vehicle which result in its extremely high cost are: all-wheel drive, radio suppression, deep-water fording equipment, and 24-volt electrical systems. These items are peculiar to the tactical type vehicle. They are not mass-produced for commercial consumption, and large government subsidies to industry are necessary to keep them in production. They are also expensive to operate, and because of excessive weight and limited cargo capacities are uneconomical for highway use.

The commercial vehicle, on the other hand, is mass-produced for a variety of practical uses. It weighs half as much as the tactical vehicle, has almost double its load capacity, and is highly desirable for the transportation of Army personnel and cargo. Also the cost of the commercial type vehicle is approximately one half that of the tactical vehicle.

In 1951, the Military Wheeled Vehicle Panel, convened by the Army Field Forces, recommended the "au-



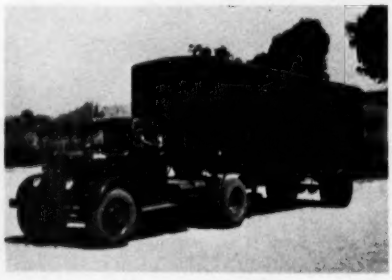
POSSIBLE USE OF TRUCK UNITS IN A FIELD ARMY

thorization of commercial vehicles in the T/O&E and T/A of those units which are normally operated where the mission of the vehicles and the probable road net permits such use." The new policy was formally announced in April 1952 by Secretary of the Army Frank Pace, Jr., who directed "the prompt utilization of commercial vehicles both in the United States and in all overseas commands, to the maximum extent feasible."

The plan is being put into effect in administrative motor pools and in service units both here and in the theaters. No sudden or mass procurement of commercial vehicles is involved, however,

Commercial-type truc s

Truck tractor: 5-ton, 4 x 2
Semitrailer: 20-ton, 4-wheel van



Truck tractor: 5-ton, 4 x 2
Semitrailer: 10-ton, 2-wheel van

and the change-over will be gradual.

Transportation people see in the plan a solution to many of the military trucking problems of the past, and the trend is being reflected in new organization, new equipment and new procedures for a more effective highway transport service.

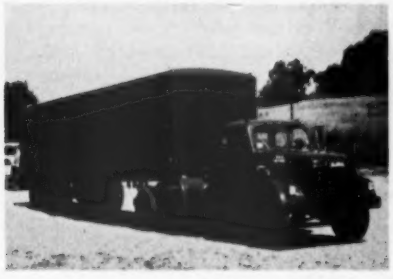
THE new light truck company, which will be employed primarily in the field army, will continue to use 2½-ton trucks, but the number of task vehicles is being increased from 48 to 60 in order to give a better ratio of personnel to

vehicles. Although there is a ten percent increase in personnel there is a decrease of .3 man per vehicle in the company. The lift capacity of the unit is being increased twenty-five percent; and, in an over-all analysis, this will result in approximately 40 fewer persons required to do the same job.

The new medium truck company, which will replace the old heavy truck company for communications zone hauling, is likewise being increased from 48 to 60 task vehicles. Personnel increases amount to 18 percent, but this is a decrease of .2 man per vehicle. Carrying capacity has jumped twenty-five percent. New powered vehicles for the company

s in use by the Army

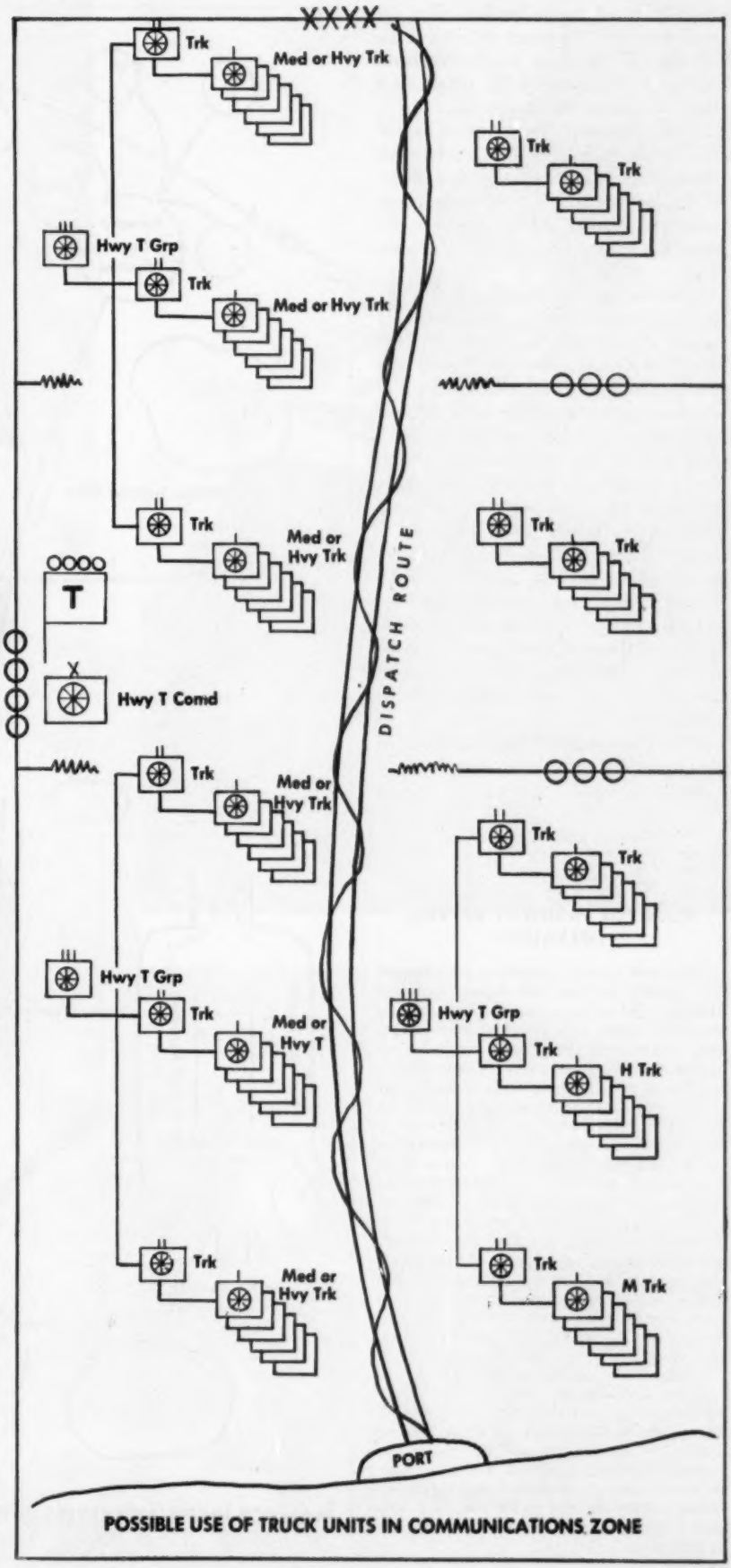
Truck tractor: 5 ton, 4 x 2
Semitrailer: 10-ton, 2-wheel stake



Truck tractor: 10 ton, 6 x 4
Semitrailer: 20-ton, 4-wheel van

consist of the 5-ton, 4 x 2, truck-tractor or the 5-ton, 4 x 2, cargo truck. A selection of 10-ton semitrailers (vans or stake and platform), 5,000-gallon bulk haulers, and refrigerator equipment will be allowed.

The heavy truck company, a completely new unit, will be employed in port and beach clearance and for long distance transportation. It will use 36 powered vehicles of the 10-ton, 6 x 4 variety (truck-tractors or straight trucks). When equipped with truck-tractors it will have 20-ton stake and platform semitrailers or vans, depending on the



POSSIBLE USE OF TRUCK UNITS IN COMMUNICATIONS ZONE

type of loads to be hauled. For the transportation of persons the unit is authorized 37-passenger convertible buses allowing it to move 1332 troops with their equipment in a single lift.

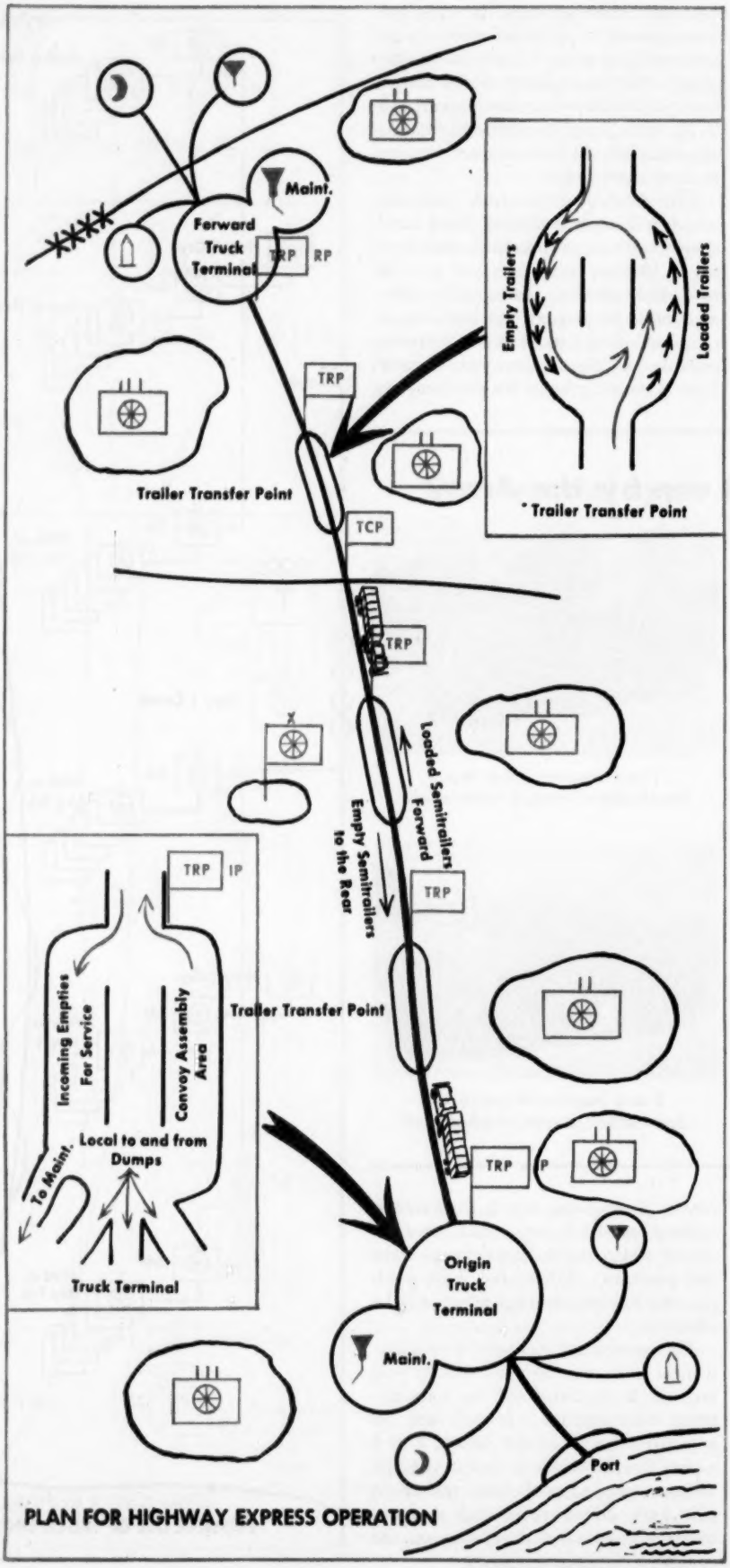
Using the same situation that existed in Europe in World War II, but employing latest methods and equipment, it can be shown just how many troops and trucks would be required to do the same job today. The results are staggering.

The original Red Ball had 20,000 officers and men; a similar operation today would require only slightly over 5,000. This is a saving of roughly 75 per cent —almost an entire division carved out of communications zone excesses and freed to fighting jobs! The original Red Ball had some 5,500 self-powered vehicles (primarily 2½-ton trucks); a similar operation today, employing large capacity semitrailers, would need only 1,150 truck-tractors. Here again, a saving of nearly eighty percent. Imagine the effect of such savings, once they are consistently employed, on the defense economy and the manpower pool! On the division slice and the replacement stream! On our combat efficiency! On the enemy!

In military logistics you use the right tool for the job—just as you use the right weapon in combat.

PLAN FOR HIGHWAY EXPRESS OPERATION

Highway express operations are planned for speedy delivery of heavy tonnages through the communications zone. The dispatch routes will be closely scheduled and controlled. Employing tractor-semitrailer equipment, one type of operation is set up as a relay with truck terminals at either end and trailer transfer points located along the route. At the origin terminal, shuttle tractors take empty semitrailers to surrounding dumps and return with loaded ones which are grouped in assembly areas according to priorities. Line tractors pick up the trailers and move them forward a half day's run to first transfer point where they are exchanged for empties on the return journey. Tractors of the second leg carry the loaded trailers on to next transfer point and the relay is continued until arrival at final terminal. Here the procedure is reversed. Terminal tractors take trailers to forward dumps for unloading and return with empties from previous trips. In this type of operation the power units sustain no delay due to loading of semitrailers and the entire operation is greatly expedited. The procedure requires close coordination of fueling, maintenance, messing and traffic control activities. A dependable communications net is essential.



PLAN FOR HIGHWAY EXPRESS OPERATION

WHERE TRUCKS ARE, THERE MUD IS ALSO

Motor vehicles draw mud like the Cavalry used to draw flies. And so a lot of effort by everyone from drivers to construction engineers has to go into combating mud. These photos from Korea are typical.

Above: **a driver digs himself out.** ***Opposite:*** **an engineer tractor hauls in some fill.** ***Below:*** **rocks and timbers repair a culvert.**

IC·X
135·5
5-1

Vehicles for the Infantry

They need to be light, quiet, low-silhouetted

Majors William R. Hughes and Larry W. Coker

"INFANTRYMEN still walk most of the time," said the sergeant, and he was very right. The infantryman's job in war hasn't changed, despite what you read in the comic books. The infantryman still has to get in close to the enemy and knock him out. And to do that he must fight on foot. But thanks to motor vehicles he can now move faster to the line of battle and with greater assurance of getting there first.

When the infantryman moves long distances (and when he's not walking) he usually goes by truck. It's also the truck that brings up the infantryman's food, ammunition, supplies and hauls his support weapons. Trucks are used for command and reconnaissance, to evacuate the wounded, to haul kitchens and a multitude of other things essential to infantry.

The trucks that do these jobs are reasonably dependable and rugged. But do these general purpose vehicles meet the infantry's needs? Would vehicles designed for infantry use be more satisfactory and economical in the long run? We won't try to answer these questions at this time but instead will take a look at what kind of vehicles the infantry needs.

As you read the following list remember that these are characteristics that apply specifically to trucks for the infantry.

(1) Low silhouette. The lower a vehicle's silhouette the farther "forward" it can go and conse-

MAJORS WILLIAM R. HUGHES and LARRY W. COKER, Infantry, are on the staff of the Automotive Department of The Infantry School, Fort Benning, Ga.

JEEPS JAM THE APPROACH TO A RIVER FERRY IN KOREA

Jeep and trailer overloaded? It all depends upon—you guessed it—the situation. Caption says this was a patrol striking into enemy territory in Korea.

quently the "haul" distance between the vehicle and the combat line is shortened. Also a low silhouette makes camouflage easier. A low silhouette is a "must" for the infantry vehicle.

(2) Cross-country mobility. If vehicles are to go forward then they've got to be able to move over rough ground. The less vulnerable the vehicle is to "bad" terrain, the more valuable it becomes to infantrymen.

(3) All-wheel drive. This, of course, increases a vehicle's maneuverability.

(4) Lightweight design. Lightness contributes to cross-country mobility (and helps eliminate such things as getting mired down in mud). Lightweight design materially increases the value of a vehicle to airborne infantry, permits manhandling over obstacles and during amphibious operations.

(5) Rugged, durable and dependable. This is plainly needed. The front-line soldier doesn't have a lot of fancy gear nor the time to fool around with a delicate, temperamental vehicle.

(6) Simplicity of design. The infantry needs a truck that is easy to maintain and has interchangeable parts and unit components.

(7) Low noise level. We don't want the enemy to hear us coming any more than we want him to see us coming. Silence (or near silence) is still a major part of the element of surprise.

(8) Fording capacity. Battlefield mobility demands tactical vehicles that can ford. This must be kept within reason, say a depth of three feet for a period of five minutes. Since infantry usually is the first to cross the rivers and streams it generally has to do it on its own.

(9) Economy. Low initial, operating and maintenance costs, plus fuel economy. If a vehicle "overeats" gas and oil the supply problem increases and the value of the vehicle decreases proportionately. More miles per gallon is what we need.

In the early days in Korea trucks moved men fast to plug holes in the lines.

THESE are characteristics we would like our infantry vehicles of the future to possess. These characteristics must be kept in mind when we discuss our present family of general purpose vehicles.[1]

Infantry vehicles will serve us better if they are economical and have interchangeable parts. This has long been our goal and results of study along these lines since 1945 have been a major consideration in arriving at a family of vehicles. It can be seen that the present family of vehicles comes considerably closer to meeting this goal than have any previous motors.

Examine the two parts of this goal in more detail:

Interchangeability of parts.[2] This contributes to ease of maintenance and requires less stockage of parts in forward echelons. It makes maintenance easier and in effect encourages maintenance. The over-all result may well be to prolong the life of the vehicle.

Economy. Vehicles should have a low initial cost and be economical to operate. The use of interchangeable parts should reduce maintenance costs by saving time, money and personnel. It's interesting to note that only about 10 per cent of the personnel in an infantry regiment are occupied with maintaining or driving vehicles.

A glance at the modifications that have been made to the "M" series of trucks since World War II is revealing.

24-volt electrical system. This sys-

Tank-riding infantry is SOP in some situations.

[1]This group includes the M38A1, ¼-ton; the M37, ¾-ton weapons carrier, and the 2½-ton M35, the latest T/O&E authorized cargo carrier. The M135, M34 and M211 are versions of the 2½-ton truck currently being produced and all are standard.

[2]The parts referred to fall into the general category of accessories. Examples are: generators, batteries, blackout lights, and the instruments that make up the instrument panel.

tem has been standardized for all vehicles. The 24-volt system provides a greater source of power and, of course, reduces cold-weather starting problems.

Waterproofing. Breather systems, and waterproofing almost make amphibian vehicles of all trucks.

Standardized instruments and lights. Dash instruments, blackout lights and similar parts are now standard for all vehicles, tactical or administrative.

Front-wheel drive. We no longer have to depend on a 2½-ton cargo truck driver's knowledge of when to engage front-wheel drive. It's done automatically.

Hydramatic transmission. The hydramatic transmission on the M135 and M211 eliminates gear shifting.

Compressors. The 2½-ton cargo trucks carry their own compressors which provide air for inflating tires and the air used by the brake booster system.

These all improve our trucks and make each a more versatile and useful vehicle, but from the infantryman's point of view they don't quite add up to the vehicle he needs. The "all-purpose" idea doesn't quite fit infantry's requirements. Let's take a look at these vehicles.

¼-ton truck (M38A1). The jeep was originally designed as an all-purpose utility carrier for infantry combat use. Today the jeep and its ¼-ton trailer is the standard ammunition carrier. It also is the weapons carrier and ammunition resupply vehicle for the battalion support weapons (caliber .30 heavy machine guns, 81mm mortars and 105mm recoilless rifle).

It serves infantry units satisfactorily as a carrier and for command, communication, evacuation and reconnaissance purposes. But it is still too heavy to be manhandled over obstacles (as we grow more airborne conscious it will undoubtedly be lightened), it lacks quietness, low silhouette, maneuverability and payload (notably ammunition) capacity. (A 2,625-pound vehicle carrying an 800-pound load [cross-country] is not efficient enough.)

¾-ton, M37. This vehicle is used to transport the infantry's 4.2-inch mortars and 75mm recoilless rifles and while useful, it does have many undesirable characteristics. It's too heavy, its silhouette is too high and its bulk carrying capacity is too limited. With a gross weight of 7,600 pounds it can carry only 1,500 pounds. It's too much vehicle for the job.

The Weasel is of use to infantry under some conditions, but it has its limitations

2½-ton cargo, M35[3] (dual-wheel flat-bed modification of the interim M34). This is the workhorse of the infantry and with the modifications mentioned earlier, driver training is made easier and there is less driver abuse. These 2½-ton vehicles have good cross-country mobility, reasonable ruggedness and are excellent as highway transportation. Whether or not the hydramatic transmission of the M135 and M211 will provide longer life to the vehicle is not yet known. But these new vehicles are bigger, heavier, more noisy and more expensive (both in first cost and in operating cost). It's unfortunate that they aren't supposed to carry payloads heavier than World War II models.

THIS critique of existing motor vehicles seems to be an appropriate place to discuss one of infantry's most pressing needs—a self-propelled mount for recoilless rifles. Recoilless rifles of various sizes are serving infantrymen well. They give some much needed close-in antitank protection (but aren't substitutes for tanks). Recoilless rifles are heavy (even the 75mm is too heavy to be man-carried for any distance with speed) and consume heavy ammunition at a rapid rate and require rapid mobility on the battlefield. So a self-propelled mount that is compact, has a low silhouette and is highly maneuverable would be valuable.

In many cases today's family of infantry vehicles are only modified models of those used in World War II. In a number of instances they are more expensive, heavier, have a higher silhouette, are less economical to operate and lack adequate payload capabilities. These vehicles are all superior in quality, but they are not *infantry* vehicles in a functional sense. We believe that infantry vehicles, light, quiet and low-silhouetted, are needed if infantrymen are to get where they're needed, when they're needed and with the firepower that's needed.

[3]The M135 and the M211 are now in production. The M135 is the successor to the World War II, GMC 2½-ton cargo vehicle. The M211 is a modified M135 with dual wheels and a flat cargo bed.

THE TRUCKMAKERS AND THE SOLDIER

. . . more than just a customer

K. T. Keller

THE mobility that permitted our World War II armies to move fast and deep into enemy territory had its origins a decade before Hitler moved into Poland. In that decade America put its army on wheels. It motorized its combat forces to a point exceeding that of any army in the world. It developed motorized transportation that was so vast and flexible that it could stretch supply lines hundreds of miles forward and maintain major forces in the field—even such large armored forces as General Patton's Third Army could be supplied with hundreds of tons of food, fuel and ammunition over hundreds of miles every day.

This achievement gave our ground forces in all theaters of the war freedom of decisive movement in combat, swift communication and transportation, and tactical flexibility enjoyed by no other fighting forces in the world.

Today our Army continues to maintain its superiority in military motorization.

It is not surprising at all that our military planners and leaders should have outpaced all others in their adaptation of the motor vehicle to military transportation. As Americans they saw the potential of the truck in military service as fully as other Americans who were developing the automobile and truck into absolute necessities of modern American life.

And behind this revolution in ground combat and transportation lies the American automobile industry.

America's army on wheels has become possible because of our country's great, peacetime developed automotive production facilities; an enormous know-how in volume production of internal combustion powered vehicles; the biggest commercial truck building operations in the world; and continued liaison between military users and civilian producers.

The wheeled military vehicle, in the quantity and quality that startled our pleased allies and unbelieving enemies, supported our vast fighting forces all over the globe, was and is possible because of these factors.

Today, neither our military forces in the field, nor our civilian economy at home, can dispense with motor vehicles. And both are the greater and stronger for having so broadly utilized this modern tool of living or fighting.

What is it about our automobile industry that has enabled it to help our Army attain its commanding lead in military transportation?

After all, the automotive engineers in many other countries may be as inventive, industrious and forward-looking, as are our own. And these countries doubtless have military planners and leaders who appreciate the power and flexibility of motor vehicles.

MR. K. T. KELLER is Chairman of the Board of Chrysler Corporation and Director of Guided Missiles for the Secretary of Defense. An automobile production man since 1906, he came up through the ranks, so to speak. His early experience was with Westinghouse engines, Maxwell and Hudson motor cars. He then moved to the General Motors Corporation and for a number of years was a master mechanic for Buick, a factory manager, a member of the Engineering Department, and a GMC vice president. In 1926 he went to the Chrysler Corporation as a vice president in charge of manufacturing. He became President of Chrysler in 1935 and Chairman of the Board in 1950.

The answer essentially is that America has within its boundaries means no other country possesses to turn out, fuel and maintain military vehicles by the hundreds of thousands, and of all needed varieties, so that it alone can truly put our ground forces on wheels.

THE idea of how a military vehicle should be designed and employed is meaningless unless it can be developed into thousands of high-quality tough, able vehicles.

That's one of the ways our automobile industry works with the military. There are four basic needs which our automobile industry can furnish.

First is experience.

The American automobile industry's experience in building trucks is fundamental to our military vehicle program. No other automobile industry in the world has built as many trucks, in as great a variety, and for as many special purposes, as our own. It has had, moreover, wide experience in military truck production and design stemming from years of serving our Armed Forces. It is accustomed to working with military designers in developing military trucks for unusual and challenging purposes.

Second is productive capacity.

None can equal American industry when it comes to turning out goods. Whether it be in household furnishings, shoes or trucks, our country leads.

In motorizing a modern military force, the ability to manufacture and maintain vehicles in enormous quantities is essential. We have that ability in our automobile industry and its many supporting industries. Furthermore, American industry has the capacity, as it is now proving to the world, to supply forces in the field, to help build a defense program and maintain our high level civilian economy, all at the same time.

Third is research and development.

The automobile industry, like many other American industrial activities, has invested immense sums in its research, development and testing facilities. All of these irreplaceable facilities, the knowledge of inestimable value that they represent, and the future discoveries that will come from them are at the disposal of our military forces.

These facilities include vast engineering and research laboratories; proving grounds, special testing installations, such as "cold rooms" and apparatus of the most expensive and complex sort. They have produced many improvements which have bettered military vehicles. Among them are such important advances as improved heat treating of parts, better surface finishes, superior corrosion protection, higher strength materials, better gear designs, improved steering, suspension and drive systems, new ignition developments, greater fuel economy and so on.

In chemical, physical and metallurgical research, electron microscopes, X-ray apparatus and radio-active tracers probe and find answers to secrets hitherto locked in Nature. Many seemingly minor detail changes in vehicle parts, or in formulae for making them, stem from signal achievements in pure research conducted in industrial laboratories.

It wouldn't be possible to pull all these accomplishments from a hat to serve immediate military requirements. Instead, the majority have evolved in commercial truck and passenger car development programs and become part of the reservoir of know-how against which Ordnance and other armed forces designers can freely draw.

And fourth, there are the savings in money, labor, resources and time that accrue to our defense effort because of that great American asset, the peacetime investment in productive capacity industry has already made.

A SINGLE example, among many, will serve to illustrate this point. I hope I may be pardoned specific references to my own company, since other examples from other automobile manufacturers would doubtless establish the point quite as well. But I am most familiar, of course, with the military truck program in terms of Chrysler Corporation.

For instance, the Government spent approximately $3,000,000 on tools for a military truck which one of Chrysler Corporation's divisions built for it. But into the building of that truck went the use of some $42,500,000 worth of existing tools and facilities which we already had built and paid for through civilian activities.

And, of course, no one can put a price tag on the value of the experience and ability acquired through years of commercial truck building that also went into manufacturing that military model.

Another example of how the experience and productive facilities, accumulated through volume-building of commercial vehicles, work to produce military trucks economically and quickly can be found in our three-quarter-ton, four-wheel-drive military truck.

Although this vehicle is conservatively rated at a capacity of three quarters of a ton, Ordnance designers specified large margins of extra strength, power, capacity and performance to make it suitable for rigorous military use in the field.

Thus our three-quarter-ton truck has an engine that we ordinarily use in a one-ton commercial vehicle. This engine is considerably modified from commercial design, of course, with its special, 24-volt electrical system, amphibious and fungi-proof equipment and many other items. But the point is that a one-ton peacetime truck engine already existed for military use in the three-quarter-ton vehicle. And it was an engine design thoroughly tested and proved in thousands of commercial trucks.

Similarly, the three-quarter-ton military truck has a clutch of a capacity that would be adequate in a two-ton commercial vehicle; a transmission, universal joints and propeller shaft which would be commercially acceptable for a 1½-ton civilian truck. The steering gear is so strong that it would be suitable to guide a three-ton truck.

The same can be said of frames, axle housings, wheels, shock absorbers and many other parts. In addition, scores of parts in military vehicles are especially designed and made for the severe requirements of field conditions. But many of these can be manufactured economically because of tooling that al-

Years of know-how accumulated by the industry are at the service of armed forces' truck designers
This is a Dodge truck assembly line

ready exists for making parts for commercial vehicles.

Looking at the picture as a whole, it would not be possible accurately to calculate the hundreds of millions of dollars which would have to be spent, to say nothing of the time and labor consumed, if vehicles for America's armed forces had to be designed from scratch and the tools and equipment needed to build them had to be developed as well.

But because of the reservoir of design, testing and production capacity already in being in the American automobile and its allied industries, it is possible to build military vehicles in quantity and quality at reasonable cost.

Today, military vehicles, tanks, shells, aircraft assemblies and jet engines pour from the plants of the American automobile industry. All of these activities benefit directly from the country's industrial growth under our matchless system of free enterprise.

THE automobile industry puts the highest priority on its responsibilities in serving the national defense. It works closely with the armed forces, not only in the development, design and production of new equipment, but in following the performance in military use of the things it furnishes the using services.

Industry sends its service engineers to work with Ordnance designers and observe first hand how trucks, tanks, aircraft components, engines and other pieces of ordnance perform.

These military and industry engineers do not want to know merely how well military equipment is standing up and performing. They also want to know what the men who use it feel about it. These representatives in the field want to know what tank drivers think about their tanks, what the ambulance driver has to say about his ambulance; what the comment on service accessibility or the worth of a piece of equipment is in a regimental motor pool.

They look for the company commander's comment, and the opinions and ideas of the GI performing first echelon maintenance. With the military the automobile industry wants this reaction.

The Army and industry know that such knowledge is practical, not academic, and can only be obtained in the field. That's why, at Chrysler Corporation, we do not allow our military service engineers to remain at the home office longer than two weeks. Then they are sent out again, to continue their close touch with men whose very lives may depend upon how well Ordnance and industry engineers have designed and maintained their equipment. And the automobile industry is very grateful to military men of all ranks for their help and candid opinion.

Further, the automobile industry has formed a committee of industry specialists to study and resolve problems of producing military equipment built by the automobile industry. It has organized another committee that deals with problems arising from material shortages and with analyzing possible substitutes for critical items. The Society of Automotive Engineers provides expert services through groups of its members for the study of special problems relating to advanced and projected designs.

Constant and close liaison and cooperation between members of the industry, the government and the using services is vital because of the ever-changing requirements of fighting forces in modern warfare. Not only are new ideas for weapons and equipment regularly appearing, but hundreds of proposed changes in existing items are constantly under review and analysis.

What may seem an excellent design today, may prove to have shortcomings when it reaches the hands of the men who must fight with it.

What may prove in battle to be a superior weapon today may be outmoded tomorrow by some new development of the enemy.

Making equipment for airborne operations is one example of change. Here, otherwise excellent vehicles may not serve because of weight or dimensions. So Ordnance designers will develop changes to give vehicles of equal performance in a lighter, perhaps smaller, "package."

To the best of its ability, the automobile industry serves such changing needs.

THE armed forces and the automobile industry, in their mutual effort to strengthen the national defense, have achieved a noteworthy dedication and praiseworthy cooperation. Yet neither, I am sure, would be content to rest on the laurels of the past or the successes of the present. Both will agree that even closer cooperation in the solving of problems connected with their common undertaking may be looked for in the future.

I do not believe I could overemphasize how important it is that designs for military vehicles continue to be guided so they will fit as closely as practicable into commercial vehicle designs, practices and facilities with all due regard, of course, for the specialized needs of the using services. The more closely this can be done, the more quickly the industry will be able to provide quality vehicles in quantity at lowest possible costs.

There is another aspect of the matter. No vehicle can be practically designed for any and all purposes and conditions.

THE Armed Forces have a tremendous responsibility. They must prepare to meet a foe almost anywhere, any place and under almost any conditions. Hence, it is obvious that military vehicles must be designed to meet an enormous range of requirements. But a vehicle meeting all situations would scarcely be feasible. And perhaps vehicles trying to meet too many situations become questionable from almost any standpoint, be it military, economic or manufacturing.

As it is, our military designers have developed tremendous versatility in military vehicles. One basic type of military truck, for example, now is furnished to haul personnel or cargo, tow guns, provide ambulance service, give mobile communications and many other important functions. The truck can operate under water, over the highway and across trackless broken terrain.

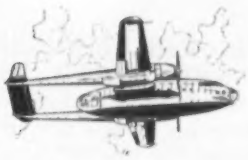
But everything cannot be included in one package. Great credit is therefore due our Ordnance and other planners and leaders for their farseeing appreciation that certain compromises have to be made in the interest of a practical approach to the military vehicle problem.

Still, the automobile industry is confident that it can produce, as time goes on, even more able, rugged, versatile military trucks largely within the production framework of its civilian truck building facilities.

Our country has, as we have seen, a big head start on our potential enemies, which lies, in an important degree, in our great industry developed for peaceful purposes. To get the most out of that productive strength depends upon how much of it we can operate directly for military purposes without costly changes in its mechanism.

The automobile industry, in its turn, actively seeks every possible way it can adapt and adjust its productive machinery, and engage its energies, toward producing the best possible vehicles and other ordnance in the quantities the Armed Forces need.

This is the industry's aim. The fighting forces are much more than customers. They are the shield protecting the nation. Nothing is more important than that to the American automobile industry.



TRUCKS FOR THE AIRBORNE

Lighter vehicles with higher performance

Major William D. Rabon

WHAT does Airborne want? Airborne wants the maximum mobility for all of the Army through full use of transport air power. It wants to fly the largest possible number of equipped forces into combat. This means that we must have as many transport and cargo aircraft as possible and an army with the lightest and most compact weapons and gear that can be devised—without decreasing the combat power of our fighting and supplying units a single iota.

There has been vast qualitative improvement in cargo and troop transport aircraft since World War II, but these gains have been offset somewhat by increased size and weight of wheeled vehicles developed for the Army. The chart on the next page shows this plainly.

In the face of this, the airborne goal can only be achieved by increasing our effort to get lighter and more compact equipment with high military performance.

Many people visualize equipment for the airborne forces as being of a special type. They usually picture an item made of extremely lightweight materials, capable of being delivered in several small components, with necessarily great reduction in performance and dependability. This kind of thinking results in equipment that is delivered on the drop zone in several small packages. In extreme cases this would require a parachuted infantryman to descend, armed to the teeth with assembly data and hand tools. He would have to assemble his equipment and heavy weapons out of a scrambled maze of parachuted parts, some of which may have been dropped on the wrong drop zone or have been lost en route. This method is obviously impractical. It would destroy the surprise that is so essential in airborne operations.

Actually, once an airborne force is parachuted or air-landed on its objective, the combat requirements of its equipment are the same as those of any other attacking combat unit. Therefore the equipment must be delivered intact and ready for immediate use. As in any successful attack, the enemy must not be allowed time to reorganize his resistance.

The best way to get equipment that can be airborne is to reduce its weight and bulk. And it is the wheeled vehicles that make the total weight and bulk of our equipment so large.

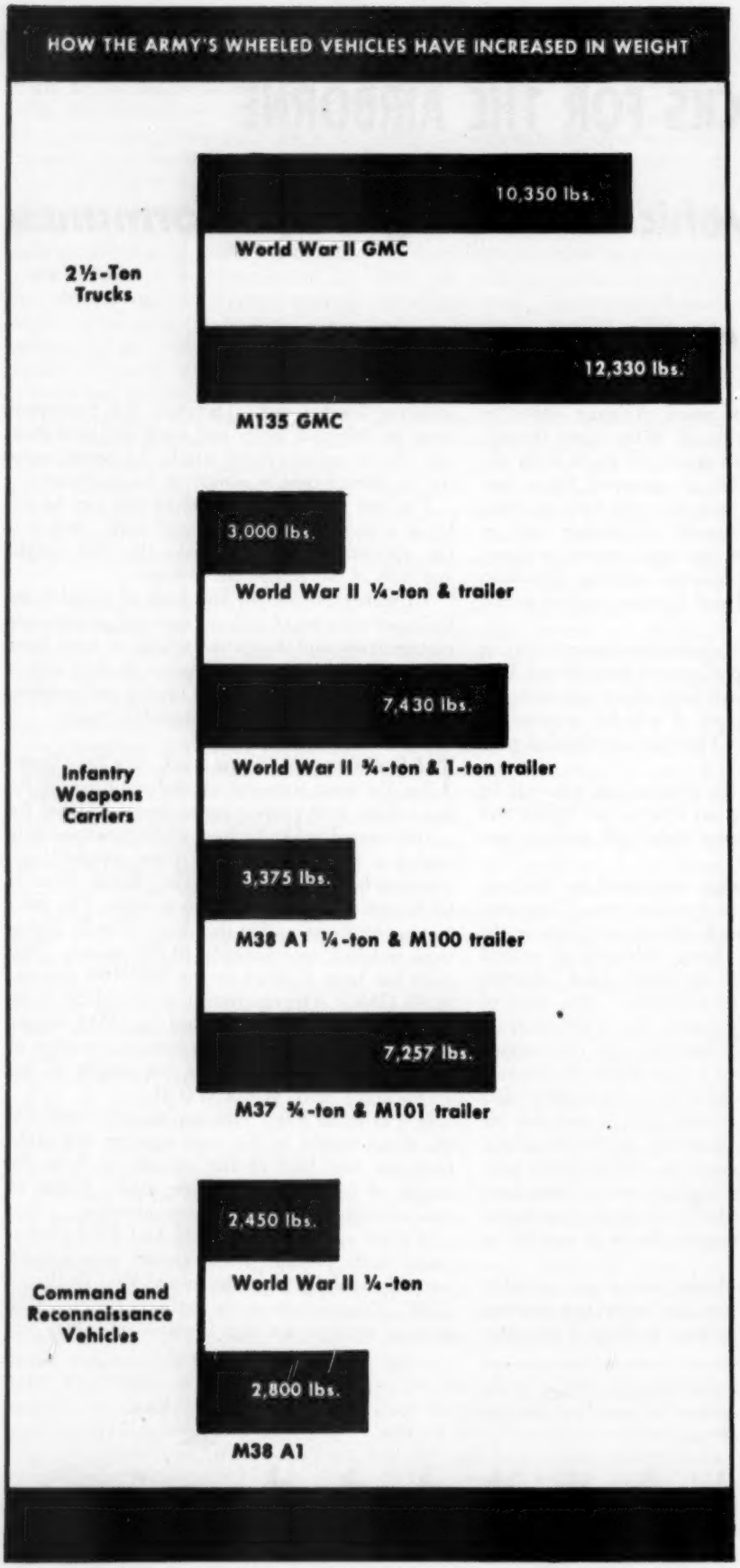
To reduce the weight and bulk of wheeled vehicles we must begin with the essential performance requirements, and design the vehicle to *meet* these requirements *and no more*. When a standard item is beefed up to provide increased tactical performance, added weight and bulk are invariable results.

TAKE a look at the 2½-ton truck. We have found that the most stringent tactical requirement for this vehicle is to provide cross-country mobility for a 5,000-pound vehicular load while simultaneously towing a light field artillery piece weighing approximately 5,000 pounds. The World War II GMC was easily capable of this mission. The chart on page 36 shows us that the World War II 2½-ton truck weighed approximately 10,350 pounds. This truck has been replaced by the M34 Reo and the M135 GMC. The net weight of the M135 is approximately 12,330 pounds and the M34 weighs only slightly less. This represents an increase of approximately one ton in the net weight of the 2½-ton truck since World War II.

If it is to be flown into combat, the additional ton of net weight in this truck must be subtracted from the fuel load of the aircraft, or from the weight of cargo loaded on the truck. Either of these definitely limits an airborne operation.

We are told that the M135 and M34 2½-ton trucks both provide much greater cross-country carrying capability than the World War II 2½-ton GMC. Exact figures on the performance capability of new vehicles are not available but they are

MAJOR WILLIAM D. RABON, Ordnance Corps, is the Ordnance technical advisor to the Joint Airborne Troop Board at Fort Bragg, N. C.



known to exceed the cross-country capability of 5,000 pounds on-vehicle with 5,000 pounds towed. In all probability the actual performance of these new vehicles will approach the required cross-country capability of a 5-ton truck. But the increase in weight and size, that made this additional performance possible, results in greater gasoline consumption and requires more logistical support. It has been said that such increased performance was necessary because the World War II GMC was consistently overloaded in combat areas. Are we to assume that these bigger trucks will not be overloaded?

A properly designed vehicle will solve the weight and compactness problem. Airborne experts believe that present engineering and manufacturing know-how can design a tactical vehicle that can transport 5,000 pounds cross-country while simultaneously towing 5,000 pounds, and confine its net weight to not more than 7,000 pounds. Such a truck, with driver and load, would be well within the lift capability of the C-119 cargo aircraft. The vehicle could also be loaded in one airplane with a towed light field artillery piece and about two tons of crew and ammunition. This would provide a basic unit of field artillery, delivered intact and ready for immediate action when unloaded.

NOW look at the infantry weapons carrier. During World War II the infantry weapons carrier was the ¼-ton command and reconnaissance truck with the ¼-ton trailer and/or the ¾-ton weapons carrier with the 1-ton trailer. A trailer reduces the mobility of vehicles and the World War II weapons carriers were limited in their ability to accompany riflemen over rough terrain and poor road nets.

The combination of the ¼-ton truck and trailer weighed approximately 3,000 pounds and carried about 1,000 pounds of weapons and equipment. The ¾-ton truck and trailer weighed approximately 7,400 pounds and carried about 3,000 pounds of weapons and equipment. The present infantry weapons-carrier combinations weigh about 3,400 pounds and 7,250 pounds, respectively, and have the same cross-country capability as the World War II combinations.

When we consider aircraft requirements we can see that the weights of these carriers are a heavy price to pay for the limited mobility we get from them. One C-119 can transport but three ¼-ton weapons-carrier combinations, with a total cargo of weapons and equipment of 3,000 pounds. The ¾-ton

combination requires one C-119 aircraft for each combination, again with a weapons and equipment load of 3,000 pounds.

Parachute delivery of the ¼-ton combination is more expensive in aircraft. Only two weapons-carrier combinations carrying 2,000 pounds of weapons and equipment can be loaded in a C-119 for parachute delivery because of the extra weight of heavy drop equipment and the fact that trailers must be loaded upright instead of being stowed on their sides alongside the carrier. The parachute delivery of the ¾-ton combination entails the same aircraft requirement as for air transport except that the drop kit eats up more than a ton of the weight capacity of the plane.

Development of a lightweight infantry weapons carrier designed especially for the airborne mission is logical. One list of specifications calls for a vehicle capable of transporting 1,000 pounds of weapons and/or equipment cross-country in addition to the driver. It would weigh about 750 pounds, and be about 30 inches high, 100 inches long, and 40 inches wide. It should be capable of operation while the driver is either riding or walking alongside. Sustained cross-country operations at speeds as low as one mile per hour without overheating are desirable.

The 100-inch length limitation permits crosswise loading in the C-119. For air transport, each C-119 aircraft could carry eight of these infantry weapons carriers, each with driver and 1,000-pound load. For parachute delivery, each plane could carry seven of them plus driver and full 1,000-pound load. The construction of the lightweight infantry weapons carrier may make parachuting of the load and the vehicle possible. This would allow parachute delivery of 7,000 pounds of weapons and equipment, with weapons carriers and drivers, from the same C-119 aircraft. But infantry weapons carriers would seldom be loaded in this manner. More likely they would be loaded throughout a series of aircraft according to the tactical requirements. Thus the combat integrity of combat units would be maintained.

This vehicle may replace the ¼-ton truck and trailer on a one-for-one basis. Crews and weapons carried by these lightweight infantry weapons carriers will not ride on them. But by removing the entire load from their backs, they should be able to keep up with, and support the infantry rifleman in his advance cross-country.

Development of the new lightweight infantry weapons carrier is under way and it may be in service test very soon.

This "jungle burden buggy," developed in World War II but never used, was the forerunner of a lightweight weapons carrier for the airborne infantry.

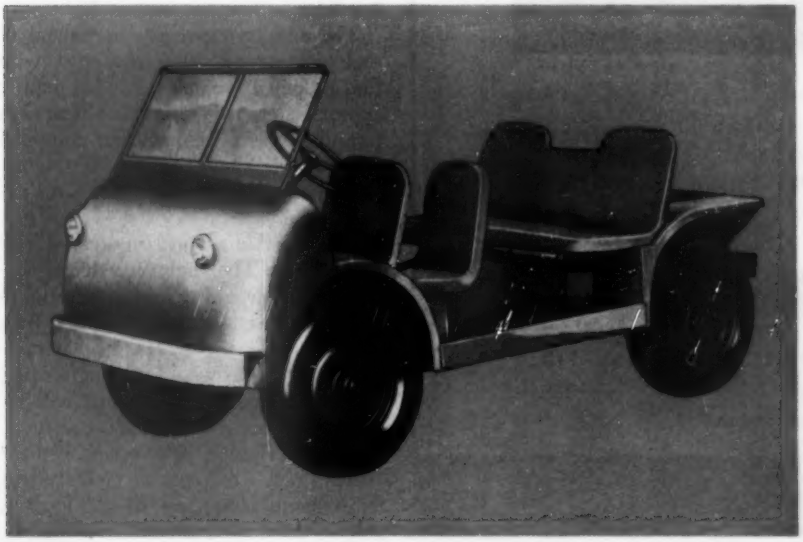
LET'S look now at the command and reconnaissance vehicle. The ¼-ton truck which served as the command and reconnaissance vehicle in World War II weighed approximately 2,450 pounds. The present M38 ¼-ton truck, weighing approximately 2,710 pounds, replaced it.

The ¼-ton truck reached its present size and configuration through a series of compromises in mission and design, caused by the desire to provide a single vehicle that could perform as a command and reconnaissance car as well as an infantry weapons carrier. The lightweight infantry weapons carrier under development will relieve the ¼-ton truck of its weapons carrier role and it can then be reduced in size and weight for the command and reconnaissance role.

The weight of the ¼-ton truck is not its only deficiency in air transport. Its length precludes economical crosswise loading in the cargo compartment of the C-119. This limits the plane to only three ¼-ton trucks regardless of how much weight might be reduced. But if the length of the command and reconnaissance vehicle was held to 100 inches it could be loaded crosswise. Seven such vehicles could be loaded in each C-119 aircraft for air transport, and at least six for parachute delivery.

A command and reconnaissance ve-

This is a command and reconnaissance vehicle designed for airborne infantry by Willys-Overland engineers. It weighs about 1,500 pounds and is 100 inches long.



HOW LIGHTER VEHICLES CAN SAVE TONS AND AIRPLANES

BY USING	WE CAN SAVE in the Infantry Division	WE CAN SAVE in the Airborne Division
7,000 lb. 2½-ton truck[1] [1]Substituting it on a one-for-one basis for each present 2½-ton truck.	2,555 tons	1,198 tons
Lightweight Weapons Carrier[2] [2]Substituting it on a two-for-one basis for each ¾-ton truck and trailer combination now used as a weapons carrier and on a one-for-one basis for each ¼-ton truck and trailer weapons carrier.	291 tons	219 tons
Command and Reconnaissance car[3] [3]Replacing on a one-for-one basis the remaining ¼-ton trucks in each division.	679 tons	634 tons
Total Savings	3,225 tons	2,841 tons

THIS TONNAGE WILL SAVE THESE AIRCRAFT[4]

C-119	403	355
C-124	128	113

[4]Computed on a weight basis, giving the C-119 a 8-ton load and the C-124 a 25-ton load.

hicle has been designed by Willys-Overland. It is 100 inches in length, weighs approximately 1,500 pounds, and is said to approximate the present M38 in performance capability. Such a vehicle is a step in the right direction, and the weight can probably be reduced still further by making minor changes in design and eliminating all luxury items.

What happens when we substitute these smaller and lighter vehicles throughout the infantry and airborne divisions? The chart on this page shows the great tonnages that can be saved without reducing the essential military performance capabilities of these vehicles. The savings in aircraft are of particular interest to those who visualize mobility through air transport. Although the necessity for tactical integrity in an actual mission will preclude utilization of the full weight capacity of each aircraft, this example is still representative.

SO long as we Americans fight our wars overseas and in enemy territory, the average military vehicle will be transported more miles than it is driven. So each pound of transportation capacity used to carry unnecessarily heavy equipment represents one less pound of beans or bullets for the fighting man.

The administrative rail movement of each infantry division would require 480 fewer 40-foot flat cars, if the division were equipped with the vehicles proposed in this article. The similar movement of an airborne division would require 430 fewer 40-foot flat cars. This loading comparison was figured on the basis of putting as many vehicles as possible on the fewest possible 40 feet by 9 feet 40-ton flat cars. Loading of small vehicles in larger vehicles was practiced, within the limitations that no special handling equipment was used.

The administrative sea movement of each infantry division equipped with the proposed vehicles would require approximately 354,000 cubic feet less shipping space. Each similarly equipped airborne division would require approximately 309,000 cubic feet less shipping space.

The possible savings in steel is also significant. The lighter vehicles described here would require less steel and other critical materials. Therefore, they would save manpower and materials.

These vehicles would require less fuel and lubricants, which in turn will reduce the transportation of POL.

We can design and produce these vehicles now. For combat mobility and for economy's sake we should lose no time in developing them.

MEETING A CRISIS IN SHOP OR FIELD

Expedients are wonderful — but dangerous

Captain Lawrence W. Fite

APPROVED methods of solving practically all of the problems that beset motor sections are taught in our schools, described in our manuals, handed down by word of mouth by wise motor sergeants, or simply followed through habit and custom. All goes well in motor maintenance if the five PESTS—Personnel, Equipments, Supplies, Time and Situation—are normal, which seldom happens. But when one or more of these PESTS is absent, problems develop that can only be solved by resorting to a temporary makeshift or substitution of some kind. What we in the Army call an Expedient.

This article is about Expedients—how to use them and when, dangers and pitfalls in their use. A number of Expedients are described, but mostly I have tried to show how situations develop that call for the use of an expedient, and how to find and use the right one when you have to.

THE TO&E tells us who should be a part of the maintenance section. But the full number is rarely present for duty. Passes, leave, sick, schools, additional duty all reduce the section's strength. The section rates one welder, but when he is putting in his time elsewhere, his job is either undone or one of the other men must be trained to pinch-hit for him. So it goes with all the specialists: the parts man, the dispatcher, the ignition specialist. The solution—the expedient—is that the entire section must be constantly learning new skills over and beyond their specialty. Men capable of learning these varied jobs are hard to find. Thus, the problem of training becomes doubly hard and the efficiency of maintenance may drop.

But there is an expedient for this, too: Borrow men from other sections. Ammunition handlers in a static situation are a possible source. So are drivers who aspire to be mechanics or battery mechanics who want additional training. You can get help from Ordnance or even from other sources when the situation permits. But the effect of these expedients hinges on additional instruction.

This brings up on-the-spot training. Classes are formed, training aids developed or obtained, and the process of beating an efficient and worthwhile team into condition is undertaken right in the organization. In these instructional periods the small skills of each man must be taught to every other man. Thus the team grows strong together.

EQUIPMENT is another factor. The tables tell what you should have—if you can get it. Special tools are particularly hard to get. Much of the maintenance equipment is old, tired and obsolete. Breakdowns occur frequently, depriving you of the use of many items. But field expedients will keep you going. If your wrecker has a bad starter and you can't get a replacement, park it on a hill or tow it to get it started.

You can charge batteries with a makeshift charger made from a heavy duty generator and an electric motor. Of course you have to have electricity for this. You can use the air system on one of the shop trucks to supply air for the shop. This is not economical, but if your compressor is sent in for repairs and there is no replacement available, this expedient will carry you through. Hand tools wear out and instruments and gages require repair. While you await replacement, you must still function, so you

CAPTAIN LAWRENCE W. FITE, Artillery, is on the staff of the Automotive Department, The Artillery School, Fort Sill, Okla.

FIRST AID

There are three approaches to the problem of starting a truck that refuses to start.

The first is to pick up a club and race around the truck thrashing it madly, howling like a baboon. This may not start the truck, but it makes you feel swell.

The second is to pick up a club and race around the mechanic who is supposed to keep it rolling, beating him until he howls like a baboon. This doesn't start the truck, but it sends you to the guardhouse.

The third is to start the truck by figuring out what's wrong with it. . . .

[But if all efforts fail] beat yourself over the head with the club and howl like a baboon until the maintenance gang comes up. . . .

From Keep 'em Rolling, A Driver's Handbook Infantry Journal Press, 1945

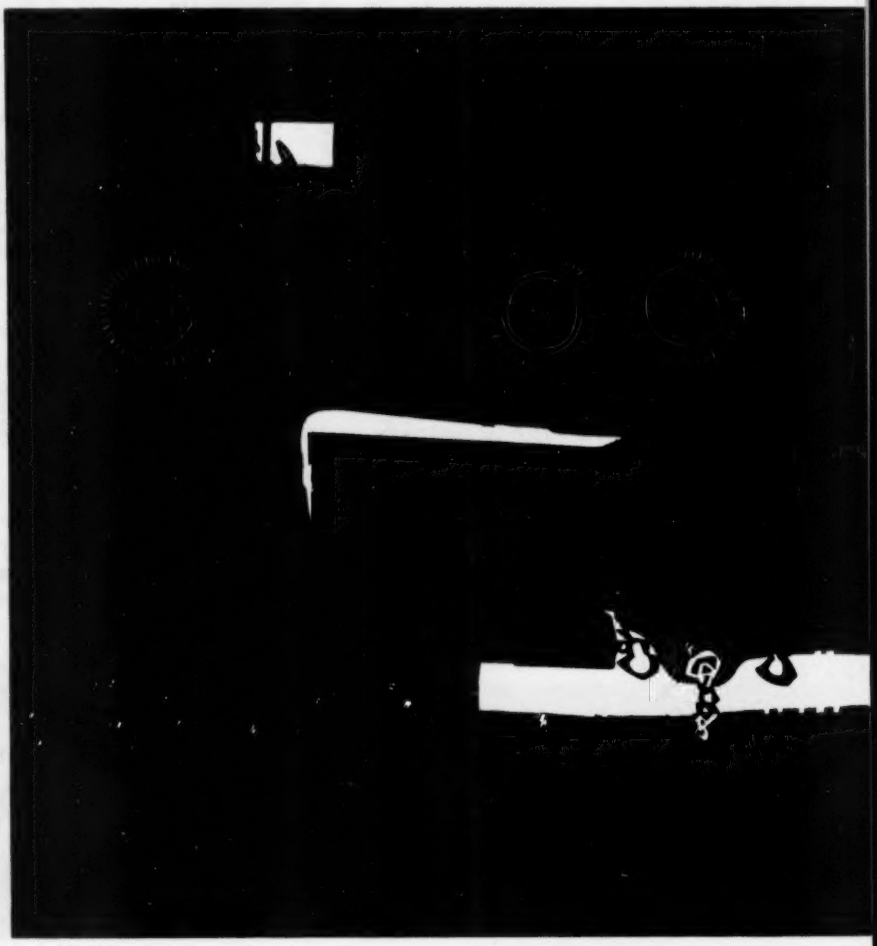
needs. This soon becomes a reciprocal operation, and in most cases, with effects favorable to the service.

"Scavenging" is particularly applicable in a combat zone. There are always wrecks, and collecting points of unserviceable equipment that provide an excellent source for serviceable parts. Even limited stocks may be built up from these sources, but don't overtax your storage and transportation facilities. A good supply of nuts, bolts, studs, washers, screws, grease fittings and similar small critical items may be collected by scavenging.

Scavenging from civilians requires utmost diplomacy. The barter of U.S. property to civilians or other allied forces is illegal. So you don't do that. Sometimes you may find an approved local procurement program, but don't start one without proper authority. "Liberated" matériel is U.S. government property, so you may use it to maintain your transportation, but do it only within the bounds of existing regulations and directives.

"Cannibalizing"—the taking of a part from a piece of your own equipment to make another piece serviceable—is strictly an expedient to be used in the direst of emergencies. Cannibalizing can become a disease that consumes and destroys all available transportation. Vehicles can completely lose their identity through cannibalization. Vehicles have been scrapped because so many parts had been borrowed from them that it was uneconomical to repair them. Vehicles have been cannibalized so that when a hasty movement came they couldn't even be towed and had to be abandoned or destroyed. Here's an example of how cannibalization can be used to advantage: A vehicle is going to Ordnance for repair, while a similar one needs a minor part and repair. By transferring the part to one vehicle, you get the use of one truck and at the same time you are taking steps to have the parts restored in the first truck. Remember though, cannibalizing is a last resort.

In the field of emergency repairs, expedients have their greatest flowering. Here the tinkerer, the dreamer, can create weird Rube Goldberg devices that work. It is here that you make something out of nothing or make a machine



improvise. The welder doubles as a machinist-toolmaker-blacksmith and makes the tools you need: a special puller, a special wrench, a new part for the toe-in gage. Or he repairs broken tools, makes tire irons, sharpens chisels, makes bolts and studs that you cannot draw. When there is a minimum of equipment, problems must be solved by using all of the ingenuity you can muster.

Next you must expedite supplies. You might include equipment under this heading, too, if you mean repair parts and expendables. No matter how many parts you have stocked, you always need the one you don't have. Where do you find it and how do you get it? First try to get it through normal channels. Always do that. Not only does this show that you made the correct effort, but it creates a need, and usage tables can be corrected accordingly.

But when the parts man doesn't come back from normal supply sources with the part you need, you must expedite. There are several procedures. You can scrounge, scavenge, cannibalize, or make emergency repairs.

Soldiers need no explanation of "scrounge." I do not offer it as approved practice, but it is an expedient to be used only in an emergency. It is a lateral procurement process. You canvass your neighbors and by fair means persuade them to supply you with your

do something that it was never intended to do. These expedients really keep 'em rolling. A complete list of expedients will never be made. The ones I have used are too numerous for one article —but here are a few such typical ones.

A LEAKING radiator may be repaired by plastering it with some water insoluble material, such as chewing gum or road tar. Kerosene (or diesel fuel) makes an excellent emergency coolant, particularly in freezing temperatures. A good stop-leak compound for small radiator or cooling system seepages, is ordinary ground black table pepper. A broken fan belt can be replaced by a spliced rope. The faulty section of a head gasket can be cut away and a piece of insulated wire or wire solder laid in the spot to hold compression or coolant until you get a new gasket. An external block crack may be patched by screwing a plate with a gasket over the fault. Most small fuel leaks can be plastered with GI soap. A self-threading screw, a piece of gasket and a washer will seal a small hole in a fuel tank. A broken fuel line can be repaired temporarily by slipping a piece of rubber hose over the two ends. A truck will run from a gravity fuel supply placed higher than the carburetor if the fuel pump goes bad. A piece of coiled copper tubing will pinch-hit for a flexible line. A cracked, shorted distributor cap can be made serviceable by drilling a hole through the crack. Ethylene-glycol antifreeze is an excellent brake fluid substitute and will mix satisfactorily with regular brake fluid. Bolts, screws, and studs may be borrowed from non-critical parts of the vehicle to make a critical part serviceable. Broken spring plies can be welded.

These are a few that I know will work but there are thousands more. With these expedients many serviceable miles can be obtained from otherwise unserviceable vehicles. A precautionary note: at the earliest opportunity the emergency repair must be replaced with the genuine article. If not, our trucks soon will become contraptions held together with baling wire and chewing gum.

TIME is factor number four. The cry that "We don't have time," becomes very monotonous. Time does largely control the extent of your maintenance. But better use of time is possible, too.

For example, a truck has upset by the side of the road. Immediately the situation must be evaluated by the man in charge. "Can it be righted with what I've got? Will I block other traffic in the process? How can I accomplish it with the least damage to equipment? Do I have time to do it now? Will I have time to come back and get it later? Will I save time by delaying traffic a little now and gaining the use of my disabled vehicle immediately?"—he must answer all these questions. If he answers them correctly he'll save time.

When making expedient repairs, the completeness of the repair may depend upon the time you have. Much precious time can be wasted by tackling a problem in the wrong way or taking unnecessary steps in making repairs. Time is not a variable. It is constant and the other factors must be made to comply with the time available.

THE last factor—the situation—may be considered as a combination of all the other factors plus the outside contributing conditions. "It depends on the situation" is definitely applicable in field maintenance. Weather, terrain, enemy activity, all have a controlling effect. The more adverse the situation, the greater the problems. However, by judicious consideration and command cooperation, the situation can be made favorable for maintenance. The maintenance section should be conveniently located and security should be provided. It should move only when absolutely necessary. It should be accessible to all parts of the organization. An effort must be made to keep the load light; that is, avoid unnecessary calls for the wrecker, seek assistance in freeing mired vehicles. The situation can be controlled, but it takes training and cooperation.

THESE then are the five factors governing maintenance. I have made no mention of how these same factors affect schedule maintenance but how they affect field maintenance and breakdown or emergency repairs. You can see that it is not necessary to sit passively and let the world and the enemy go by, but that you can do something for yourself to alleviate adverse conditions. The whole process has extremely gratifying results. The more you do for yourself, the less supporting services have to do for you. The less they have to do to help you in these field expedients, the more they can do for you in the scheduled mintenance program. Everybody gains, but note—it doesn't just happen. It takes definite aggressive action on somebody's part, usually the battalion motor officer, to spark these efforts. The result is the accomplishment of the mission, making available a maximum of organizational transportation.

Infantry School Instructional Material

The following new instructional material suitable for non-resident as well as resident instruction may be ordered from the **Book Department, The Infantry School, Fort Benning, Ga.,** at the prices shown. (The COMBAT FORCES Book Service regrets that it cannot handle orders for these pamphlets.)

WEAPONS DEPARTMENT

Transition Firing: No. 1269. Transition firing of marksmanship qualification course for M1 rifle; concurrent training in landscape target firing. 8 hours. 10¢

Marksmanship, Cal. .30MG M1917A1: No. 1329. Range procedure, emplacing; zeroing, sighting and aiming, and manipulation; practice firing, Table L, Course A. 4 hours. 10¢

Technique of Fire, MG Cal. .30: No. 1379. Final protective lines; sectors of fire; range cards; auxiliary aiming point; position defilade. 8 hours. 10¢

TACTICAL DEPARTMENT

Reinforced Battalion, Armored Division in Defense: No. 2614. Conference and terrain exercise emphasizing principles, organization, planning and conduct by a reinforced battalion and company of the armored division in mobile defense to include demonstration of a reinforced company occupying part of the outpost system. TF 17-1560, "Tank-Armored Infantry Team in the Mobile Defense." 4 hours. 50¢

STAFF DEPARTMENT

Casualty Reporting: No. 6506. Familiarization with the responsibilities of battalion and echelon commanders for the collection, evacuation, identification and burial of deceased personnel subject to military jurisdiction; casualty definition; procedures for the collection of information including circumstances known by individuals witnessing the occurrence, covering all types of casualties; importance of prompt and accurate reporting; disposition of personal effects of deceased personnel; reports required; responsibilities for preparation of sympathy letters; and restriction on correspondence. 2 hours.

Introduction to Company Supply: No. 7651. Duties of company supply personnel and their relationship with other supply personnel; types of property; use of allowance publications. 1 hour. 35¢

FRONT AND CENTER

More, rather than less unification, would seem to be the goal of President Eisenhower's Administration. It is notable that the President spoke of the need for "a strong fighting *service*" rather than *services* in his State of the Union message (*Page 8*) and also warned against letting "traditions or habits stand in the way of developing an efficient military force."

✦ ✦ ✦

The increasing effect of atomic and other new weapons on the doctrine, organization and equipment of the Army is seen in the announcement of the establishment of an Office of Special Weapons Developments Director at Fort Bliss, Texas, as a field section of the Office of the Chief of Army Field Forces. His job will be to maintain liaison with other agencies, plan and direct Army participation in special weapons developments and tests, make evaluations and reports, and keep Army authorities abreast of developments.

✦ ✦ ✦

Congress will probably repeal two unfortunate riders to service appropriation bills. On the Davis amendment restricting promotions Chairman Short of the House Armed Services Committee got his figures of speech mixed but still was clear enough when he said: "It was aimed at the top brass, but hit the junior officers. We were asleep at the switch." The Committee was told by its Chief Counsel that he could "not see the validity of a further extension of the so-called Van Zandt Amendment. It [had] served its purpose"—of keeping regular officers from retiring as long as reservists were on involuntary active duty and enlistments were being extended.

✦ ✦ ✦

In his valedictory, retiring Air Force Secretary Finletter spoke as though the Air Force was still unhappy over the organic aviation of the Navy and Marine Corps. He said it was time to review the Key West-Newport inter-Service agreements of 1948. He said that he thought the recent Army-Air Force agreement on Army use of helicopters and small fixed-wing aircraft "is only sensible," that he favored a Marine Corps air force as long as it wasn't built and maintained at the expense of the Air Force, and that "as far as the Navy goes, that is a problem which has to be settled at a higher level than the services."

✦ ✦ ✦

Inactivation of two corps headquarters in the U.S. doesn't mean that the Army is reducing its combat strength. The corps were activated following the outbreak of the Korean Conflict when future mobilization requirements were uncertain and to help in the then pressing job of creating trained units. With the Army's strength stabilized and the training program well set up, the work of these corps headquarters could be assumed by army headquarters without loss of efficiency and with some saving in manpower.

✦ ✦ ✦

Noting that "malicious attacks" are sometimes made on men in uniform, Mr. Truman in his final press conference read a statement praising the armed forces. "I believe that our military leaders are doing a tremendous job and doing it well. . . . I know no group of men more deserving of our respect, gratitude and support," said the retiring Commander in Chief.

✦ ✦ ✦

Mr. Lovett's observation that reorganization of the Army's technical services "would be no more painful than backing into a buzz saw" and that he has seen one memorandum outlining a "promising" method remains a small mystery. Department of Defense officials say they can't identify the paper Mr. Lovett referred to, although one report has it that the study or a similar one had been prepared by Karl Bendetsen, a former Assistant Secretary of the Army. It is possible, though, that details of the proposed reorganization and justifications for it may be made public before this appears. Certainly arguments against the technical services are as old as the services themselves. And also certainly, as Mr. Lovett observed, the system works—"amazing" though it may be to him and others.

✦ ✦ ✦

One million persons go in the military manpower pool each year—that is, they become 18½ years old—and a million go out at the rate of 90,000 a month, Mrs. Anna Rosenberg reported in a final summary of her activities as Assistant Secretary of Defense for Manpower and Personnel. This manpower pool is low because the birth rate in the 1930s was low and will not increase appreciably until 1960. Military manpower requirements can only be met, she suggested, by tightening up college deferments, making it clear that such a deferment is a postponement and not a virtual exemption. Students who become fathers while in school should be required to serve and she recommends that all who have become fathers since 25 June 1950 should serve.

✦ ✦ ✦

Veteran newspaper correspondents in Korea were as unhappy over the first distorted newspaper account of Operation Smack as the Army. After pleading with Eighth Army to give them more opportunities to cover combat operations at first hand, these newsmen were aghast when an inexperienced newcomer in their ranks told the story in terms of the lurid cover put on the operations order and called a "scenario" by a likewise inexperienced PIO. It was reported that the first hint many of the experienced correspondents had of this fiasco was urgent queries from their editors on that reporter's "scoop."

LT. COL. HOLLIS C. CLARK

Almost annually for a good many years your Editors received a pleasant call from a very spry and alert former Editor. Lieutenant Colonel Hollis C. Clark, Infantry, Retired, never lost interest in the doings of your Association and long made it a custom to come in to pay his respects briefly to new Editors. Colonel Clark was Editor of the *Infantry Journal* and Secretary of the U. S. Infantry Association from December 1906 to May 1909. Those were the days when the Infantry Association was fighting a hard battle to "lift the Infantry out of the peasant class," as one veteran aptly put it. Under Colonel Clark the *Journal* was a fine professional magazine as well.

Colonel Clark, 85, died at Walter Reed Hospital on January 5, 1953.

FROM THE SCHOOLS

THE INFANTRY SCHOOL

Clarification

In this space in the January issue, in an item on "Marksmanship" the system used at The Infantry School of giving a coach added incentive to "coach" his pupil during rifle marksmanship training was described. The article stated that the School "has adopted a system that allows the coach to add extra points to his score if the pupil qualifies." Some misunderstanding has arisen over the exact use made of the "points" referred to in the article. The points, 10 for expert, 7 for sharpshooter, 3 for marksman and none for failure to qualify, are added to the *coach's academic grade* for his rifle marksmanship firing. The additional points in no way affect the coach's or firer's qualification scores as outlined in FM 23-5; they affect only the academic grade of the coach under the School's grading system.

Monographs

Every Infantry Officer Advanced Class student now prepares a 2500-4000 word thesis on a selected military subject. Each officer also gives a 20-minute oral presentation based on his written material.

These monographs cover almost all phases of training, tactics and administration as well as many new ideas. After grading they are filed in The Infantry School Library and become valuable reference material.

New Commandant

Brigadier General Guy S. Meloy, Jr. assumed command of The Infantry Center on 10 January. Before this assignment, General Meloy was the Assistant Commandant, TIS. His predecessor, Major General Robert N. Young is now Deputy Assistant Chief of Staff, G1, Department of the Army.

Semi-Portable Range

The Weapons Department and Combat Development Section and AFF Board No. 3 are currently testing the Ground Combat Assessor, a semi-portable electronic range. GCA is an electro-mechanical device consisting of three E and one B type metal silhouette targets set up at varying ranges. The targets can be raised or lowered by remote control. They can also be arranged to raise and lower automatically at specific pre-set intervals of time or to count hits during a specific time interval. One of the E silhouette targets is mounted on a dolly and can be traversed along a 65-foot track, its speed and direction being controlled by the operator.

The scoring apparatus consists of a microphone, mounted below the target, which picks up the sound of the projectile striking the metal target. The resulting electrical impulse is relayed to a counter at the operator's console.

If the results of current tests are favorable it is likely that the Ground Combat Assessor may be used at AFF installations for transition and field firing.

THE ARTILLERY SCHOOL

New Training Aid

The Department of Air Training has added a model of Fort Sill and the surrounding area to its training aids. Constructed by the post training aids section, it will be located in the new Link trainer classroom.

Eight circuits beneath the large table on which the model is mounted will furnish power for the field and obstruction lights. A complete blackout is possible, to simulate night flying conditions. A panoramic back drop is provided to show prominent check points on the horizon.

The model will (1) orient incoming students on the Post Field traffic patterns and the general formation of local terrain; (2) simulate arrivals and departures at Post Field in conjunction with Link activities; (3) provide training for control tower operators.

New FA Training Tests

A board of officers, representing the various departments of TAS, has completed revision of Army Training Test 6-1, Field Artillery Battery. The new test emphasizes speed and accuracy in the adjustment and delivery of fire, cutting the time allowed for all observed missions and increasing the required survey accuracy. The test has been forwarded to OCAFF for review. Training Tests 6-2 and 6-3 on the field artillery and rocket battalions are also being revised.

Tests for Artillery Weapons

Basic periodic tests for field artillery weapons to determine that the sight mount remains in correct relationship with the tube throughout the limits of elevation and to check the adjustment of cross- and longitudinal-level bubbles have been developed by Ordnance, tested by TAS, and adopted for the Artillery. These tests are to be performed at the discretion of the unit commander but suggested intervals are: a year for guns used for nonfiring training, three months for guns that are fired, and as soon as possible after extensive use, accidents, or movement across rough terrain.

Before testing the fire control equipment a gunner's quadrant to be used in the tests is given an end-for-end test and the trunnions are leveled. Leveling of the trunnions is checked by observing that the axis of the bore tracks a plumb line throughout the limits of elevation. The plumb line is suspended so that it hangs about five feet in front of the muzzle of the weapon being tested. The tests of the on-carriage sighting equipment are then performed as prescribed in the new weapons series of field manuals (FM 6-75, FM 6-76, FM 6-81, etc.).

At the completion of these basic periodic tests, with all sighting equipment in proper adjustment, lines are scribed at specified points across the fixed and movable parts of the sight mount. At any later time when leveling is impossible and it is desired to bore sight the gun, these scribed lines are matched. This is to obtain the same relationship between the axis of the bore and the sighting equipment that existed during the tests.

Although these tests are conducted by the using artillery units, indicated adjustments are performed by Ordnance service units.

Medical Instruction

Students at The Artillery School are showing interest in the medical subjects recently included in the curriculum. Included are such topics as hygiene and sanitation, medical aspects of atomic warfare, staff and command relationships of the surgeon, medical plans, and evacuation of the sick and wounded. These topics are presented with the dual purpose of outlining the responsibilities of the commander and the surgeon, and of showing how these responsibilities are the mutual concern of both.

A sizable portion of the study is given to the organization, functions, employment, and communications of the medical units within, and in direct support of the division, emphasizing that the medical facilities of a command are the commander's responsibility.

Medical channels and facilities are studied to provide a working knowledge of the medical means available to the commander, both as organic detachments furnishing unit medical support to the artillery, and the neighboring facilities which become involved in the medical care of the artillery observation and liaison personnel on duty with the supported unit.

Irons in the Fire

Midget Submarine

Fairchild Engine and Airplane Corp. is to design and build a prototype 25-ton midget submarine for the Navy. While specifications of the small craft remain classified, company officials confirmed that it could be used to project guided missiles. Such a sub could likewise be taken to sea by a larger undersea craft and launched close to enemy target.

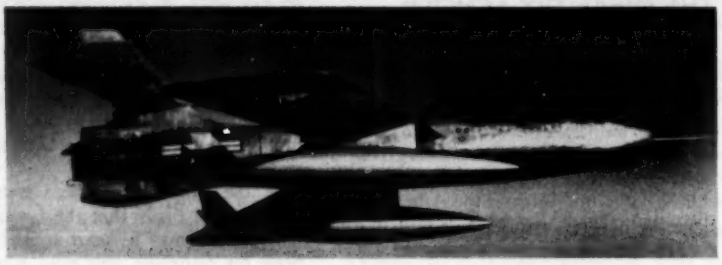
Portable heater

Portable Heating Plant

A portable heating system designed for use in temporary construction or for emergencies has been developed by National Heater Company. Military applications and uses are apparent in it.

These oil-fired heating units come in six sizes ranging in output from 200,000 to 1,800,000 BTUs. The heaters have induced draft blowers and require only a short vent connection for exhaust. An adjustable belt drive fixes the draft at proper intensity. For indoor use the heaters can be mounted on casters, and skids can be used for outdoor installations.

Ambulance jeep has 100-inch wheelbase



Republic's high speed, high altitude XF-91 interceptor

Rocket Plane

USAF's very-high-speed interceptor plane, the XF-91, built by Republic Aviation, recently completed the first supersonic rocket powered flight ever made by an American combat-type fighter. The announcement revealed that supersonic speeds were reached but all performance details are restricted. Extra power for the supersonic speeds is furnished by a 6,000-pound thrust rocket engine in addition to J-47, 5,200-pound thrust turbojet engine and afterburner.

Tank Recovery Vehicle

Chrysler Tank plant will produce a new tank recovery vehicle for Army Ordnance just as soon as engineering work has been completed. Details have not been disclosed.

Heavy Equipment Drop

The first mass paradrop of heavy engineer construction equipment was recently completed by Army Engineers and Air Force troop-carrier units. Forty Fairchild C-119s were used to drop some 400 tons of special construction equipment, which included: a 21,000-pound crawler tractor with bulldozer, 21,000-pound front-loader tractor, an 18,000-pound rubber-wheeled tractory, an 18,000-pound grader, a 17,500-pound dump truck and a 13,000-pound scraper. As many as six 100-foot chutes were required to bring the heavy vehicles safely to the ground where they were immediately put to use by the engineer troops in constructing a 4,000-foot airstrip.

Armor, Lower Torso

Combat troops in Korea are now testing "bullet-proof" shorts. They are made of the same material as the armored vest—12 layers of flexible, spot-laminated nylon duck, encased in a water-resistant vinyl layer with an outer covering of six-ounce nylon fabric known as "lower torso armor," the shorts protect the hips, abdomen and groin. The shorts are worn with suspenders and come in small, medium and large sizes with side laces for adjustment. Each set weighs four pounds.

Jeep Ambulance

A new jeep-ambulance will soon go into production at the Willys-Overland plant at Toledo. With a larger wheelbase (100 inches instead of the standard 81 inches), the Jeep ambulance has an extra long body with ample space for litters. It can accommodate three litter patients or two litter and as many as four ambulatory patients, and still allow room for a medical attendant. The entire vehicle is inclosed and has a forced-air heater, providing complete weather protection. The parts used in its manufacture will be 96 per cent interchangeable with other jeeps used by the services. The vehicle was tested at Aberdeen Proving Ground, Md., Ft. Knox, Ky., and the Marine Corps' Quantico, Va. base.

★ BOOK REVIEWS ★

BARUCH: ADMINISTRATOR AND PROPHET

PEACE THROUGH STRENGTH. *Bernard Baruch and a Blueprint for Security.* By Morris V. Rosenbloom. Foreword by Eleanor Roosevelt. Afterword by Charles E. Wilson. American Surveys, in Association with Farrar, Straus & Young, 1953. 325 Pages; Index; $3.95.

Some few years ago, Mr. John D. Small, the Chairman of the Munitions Board, said, "The heart of our armed forces is the American fighting man, but the muscle consists of the ships, tanks, guns, and bombers, the fighting aircraft, and the other instruments of war with which he carries out his fighting mission." No other nation has factories, management, and skilled labor comparable to those of the United States and as capable of providing the necessary "muscle" to its armed forces. These resources in tools and in the other economic potentials of the nation are, however, of little value unless there is an effective organization in time of war to coordinate their operations and divide the output with wisdom and justice between the armed forces, the civilian population, and our allies.

What that organization should be, and what administrative methods it should adopt, has been the constant preoccupation of Mr. Bernard M. Baruch during much of his long life. His essential contribution to victory in World War I as head of the War Industries Board has already been recognized by history in full measure. Ever since that experience, he has been the advocate of sound preparedness and of intelligent planning in time of peace for the use of our resources in a major war. He has been not only a capable organizer, but an effective administrator and a wise prophet. Too often his words have fallen on deaf ears, but he has never been fearful of repeating his recommendations that should be carefully heeded by all American citizens. This country owes much to Mr. Baruch. How much, is proved by Mr. Rosenbloom's book, which provides the opportunity to become familiar with Mr. Baruch's achievements and philosophy.

World War I gave Mr. Baruch his first lesson in economic mobilization. It showed the difficulty of improvising in the critical confusion of a major war. He has repeatedly reminded us that the cost of extemporizing in 1917-18 could be measured in billions of dollars. In spite of his efforts, in 1940-41, one ineffectual agency after another was set up, attempting to devise an effective over-all control for the growing economic mobilization to meet the world crisis. The problem was ultimately solved, but again at excessive cost and with too much delay, largely through neglect of Mr. Baruch's teachings.

Mr. Baruch's program for keeping the peace in a troubled world has always been, first and foremost, well trained and well equipped armed forces. Behind them, he has advocated in peacetime a nucleus of a super agency that would appraise our resources, determine our requirements, and prepare plans for the effective use of our national potential. This skeleton organization could be expanded in the event of war by the mere addition of personnel. It would definitely prevent the disastrous and costly improvising of two World Wars, and if Mr. Baruch's advice were taken, it would certainly diminish the inflationary trends that inevitably accompany war.

In her foreword to this book, Mrs. Eleanor Roosevelt asserts that, "Mr. Rosenbloom has captured the very essence of this man's great wisdom and vision." In a final chapter, Charles E. Wilson, former director of the Office of Defense Mobilization after Korea, expresses the hope that this book will preserve the lessons of the past, and acknowledges his own debt to Mr. Baruch. Mr. Rosenbloom's book, although it would have been more useful if the contents had been better organized, should help to counteract some of the defects that Mr. Baruch observed in 1949, when he said, "Lack of self-discipline, weird economics, strange ethics, and perverted logic, if persisted in, will surely destroy us." Mr. Baruch's example of patriotic devotion and his thoughtful teachings will help to preserve the republic in the divided world of the second half of the twentieth century.—Brigadier General Donald Armstrong.

TOWARDS UNDERSTANDING USSR

SOVIET ATTITUDES TOWARD AUTHORITY. By Margaret Mead. McGraw-Hill, 1951. 149 Pages; $4.00.

THE ORGANIZATIONAL WEAPON. By Philip Selznick. McGraw-Hill, 1952. 350 Pages.

These are both studies prepared and published for the Rand Corporation which under Air Force and Ford Foundation auspices, has been doing much valuable research for the past several years.

Miss Mead, foremost of American anthropologists, headed the team that sought the material for *Soviet Attitudes Toward Authority* and drafted the report. In determining the attitudes it was necessary to use all methods of fact-finding except direct observation. For this, second-hand observation was of necessity substituted. There is a full outline of the Soviet systems of authority and the customary responses to them.

Miss Mead writes in technical language but since she is one of our best living scientific writers, her book is readable though technical. She brings out a great deal we should all know about the Soviet people and their leaders.

The Organizational Weapon is also of much value in giving us the Soviet concept of the "combat party" and its uses in the aggressive aspects of Communistic development. There is helpful material also on the vulnerability of institutional targets, but the study is not the practical rule book for handling Communist infiltration which it might well have been. It is the background material for such a book.—G.V.

PEACE THROUGH UNDERSTANDING

THE TAMING OF THE NATIONS. By F. S. C. Northrop. The Macmillan Company, 1952. 362 Pages; Index; $5.00.

Why was the Communism of Mao Tse-tung victorious over the democratic liberalism of Chiang Kai-shek in China? Mr. Northrop's answer to that question is the key to his thesis that power politics and the balance of power will never keep the peace. Nor will a foreign policy limited to dollar aid suffice to win nations to our side. According to Mr. Northrop the most effective measures in international relations are based on an understanding of the minds of foreign peoples as expressed in their religion and philosophy. To be precise, here are the four major reasons that Mr. Northrop discovers to explain Communist success in China:

"First, the Communists give great initial attention to understanding any culture they hope eventually to take over, paying attention to its inner, basic beliefs and mentality as well as its outer needs and forms.

"Second, they put themselves on the side of the resurgence and revivification of the indigenous cultural beliefs instead of merely imposing foreign ideas, as previous imperialisms have done. Every movement for the resurgence of Asia or of Islam is infiltrated and vigorously supported by Communists. . . . The Communists won China in part because they first made the Chinese feel that they were taking them back to their own traditions and making them vital Chinese and vital Asians rather than artificial imitations of Americans and Westerners.

"Third, when the Communists turn to the introduction of their own mentality they begin not with a heavy gift of arms or of technicians or of money but with their Marxist ideas. This is why indoctrination is the essence of Communist practice. The Marxist knows that if you do not capture the mind, anything else you do will not succeed.

"Fourth, the Communists succeeded in China because Chiang Kai-shek failed long before the Americans stopped backing him. He failed because he was unable, while under the pressures of instituting social reforms and resisting military invasion, to make compatible the doctrine of filial piety of his Chinese Confucianism with his Methodist Christianity and Western liberal constitutional nationalism."

Mr. Northrop sees in the challenge of Asia to the West the end of a foreign policy that concentrated too exclusively on relations with Europe. Consequently his efforts here are directed to explaining the subtle and difficult ideologies of Islam and Asia. These are examined against a background of the theory and practice of Russian Communism and of the present

Western civilization in which we play a major role. The author sees hope for an ultimately peaceful world in the trend toward a smaller number of cultural political units, but the process must necessarily be slow and arduous. As long as there is no change in the Communist aim of proletarian world revolution—and there is little probability of such an event—our efforts must be continued to build a world legal order with a police force adequate to restrain Communist aggression.

Whether or not we prefer the theories of international relations advanced by Messrs. Acheson and Kennan or agree with the theory of history developed by Mr. Toynbee, all of which Mr. Northrop believes untenable, we can profit by the latter's analysis, in this book of the mind of Islam, Asia and Russia. It is extremely hard reading with its many philosophic abstractions, but rewarding in the new light it throws on the world we live in.—BRIGADIER GENERAL DONALD ARMSTRONG.

"SAUCERS, GALLEY PROOFS"

FLYING SAUCERS. By Donald H. Menzel. Harvard University Press. 319 Pages; $4.75.

Dear Editor:

(1) Received large bundle identified as "Saucers, galley proofs."

(2) After mature deliberation, concluded that this was not a proof that "Saucers were found in Galleys" (Roman or Nautical).

(3) Attempted to evaluate same, playing solitaire with miscellaneous assorted sheets. Learned a good deal about solitaire.

(4) Concluded that Menzel (who has a fine reputation in solar studies) has written a very good book in which (a) he explains both historical and present-day saucer epidemics in terms of honestly seen natural phenomena, (b) disposes of the normal hoaxes, (c) takes a few excursions into "other worlds," (d) gives a scientific basis (sometimes not as quantitative as I should have preferred) for explaining all sorts of fascinating observational illusions, (e) does all this in a rather attractive style.

(5) Book is recommended: (a) subject matter interesting, (b) well handled, (c) provides ample testimony and proof to the infinite capability of human beings to "interpret" what they see in terms of their hopes and fears—not always corresponding to the facts.

(6) Book recommended for: (a) saucer fans, (b) intelligence and briefing officers, (c) the curious. Best regards,—G. C., FLYING SORCERER.

EXCELLENT GUIDE

THE AIR FORCE OFFICER'S GUIDE. By Lt. Gen. George H. Brett, USAF Rtd., and Albert Douglas. McGraw-Hill Company. 190 Pages; Illustrated; Appendix; Index; $5.00.

There have been innumerable editions, versions, and approaches to an Army Officer's Guide and many of them have been inadequate, to put it mildly. But here is a guide for Air Force officers that seems really to fill the bill very well.

First of all, *The Air Force Officer's Guide* is quite complete. That is to say, it has most all of the useful information in it that an Air officer would not find readily available in official publications. Secondly, the book is well arranged and has a complete index and is thoroughly usable. Many of the illustrations in the book are just decoration but those that are essential are well done. And finally, the writing is straight from the shoulder and downright pleasant to read.

Actually this book is similar to good Army guides. You'll find chapters devoted to organization, customs of the service, history of the Air Force, personal conduct, and so on. However, the lively writing and the economy of words make it fun to read. One humorous example of the economy and force of the writing style may be found in a chapter directed at the Air Force wife. It seems worth quoting: "For example, you should never decline a formal invitation from the commanding officer of your husband's base without a sound excuse, such as having just died. . . ." Are there any questions?—R.F.C.

RAILROADS, NORTH AND SOUTH

THE NORTHERN RAILROADS IN THE CIVIL WAR, 1861-1865. By Thomas Weber. Columbia University Press. 318 Pages; Index; $4.00.

THE RAILROADS OF THE CONFEDERACY. By Robert C. Black III. University of North Carolina Press. 360 Pages; Illustrated; Maps; Index; $6.00.

Few persons in either service in 1861 had given much thought to the possible use of railroads for attaining mobility in military operations or even for quick supply of field forces. After the outbreak the railroads themselves hardly knew what was expected of them. Soon they were being used to an extent never before seen in the world's history. That is the story these two books combine to tell.

The demands of the war contributed much to the improvement of our railroads. This period hastened the tying together of many unconnected lines, the change from wood to coal for fuel, conversion from iron to steel, standardization of gauges and equipment, the development of special rolling stock like hospital cars, armored cars, and railway artillery.

Over half of Mr. Weber's solid text deals with operational and economic problems, interesting more to the student of transportation history than to us. But it gets down to the business of war in the latter half. The U. S. Military Railroads was an outfit operating out of the War Department that ran all railroads in areas captured by Union forces. It was not controlled by field commanders. Fortunately, the Army employed experienced railroaders for whom a train's sole mission was to move men and the things they needed to fight a war, from where they were to where they were needed, as often and as quickly as possible. They allowed no interference by quartermasters or generals with ideas of using cars for warehouses or quarters. The accomplishments of USMR are amazing, as Mr.

COMBAT FORCES BOOK SERVICE

ALL BOOKS LISTED HERE ARE AVAILABLE FOR PROMPT SHIPMENT

If you send cash with your order, we offer you an extra bonus of dividend coupons worth 15% of the cash you send. Please include with your payment for each order (cash or charge) 25¢ to cover postage and handling.

BOOKS ADDED TO STOCK

The Shorter Cambridge Medieval History (2 vol.) 12.50

History of Our Westward Expansion

Across the Wide Missouri (DeVoto) 10.00
The Course of Empire (DeVoto) 6.00
The Year of Decision: 1846 (DeVoto) 4.00
Three Battles 4.00

NOTEBOOKS, GUIDES, and TRAINING AIDS

Air Officer's Guide	4.00
The Air Force Wife (Shea)	3.00
The Army Wife (Nancy Shea)	3.00
Battery Duties (Cocklin & Boatner)	
Cloth	2.50
Paper	1.50
Company Administration (Virtue)	3.25
Company Duties (Boatner)	
Cloth	2.50
Paper	1.35
Handbook & Manual for the NCO	
Cloth	3.50
Paper	2.50
Hard Pounding (Court) [Antitank tactics]	2.50
Map & Air Photo Reading	2.75
Map Reading for the Soldier (Geodfriend)	1.00
Notes for Troop Instructors	
Combat Formations	1.00
Elementary Map Reading	1.00
First Aid	1.00
Mech. Tng., Carbine, Cal. .30, M2	1.25
Mech. Tng., Rifle, Cal. .30, M1	1.75
Rocket Launcher, 2.36"	1.25
Interior Guard Duty	1.50
Military Courtesy & Discipline	1.00
Pistol, Cal. .45, M1911 & M1911A1	1.00
Officer's Guide	4.00
Platoon Record Book (Not sold singly. Orders for 2 or more copies accepted.)	.50
Squad Record Book (Not sold singly. Orders for 4 or more copies accepted.)	.25
Technique for Adjutants (Chester)	
Cloth	2.50
Paper	1.00

RUSSIA AND WORLD COMMUNISM

Capital (Karl Marx)	2.45
March of Muscovy (Harold Lamb)	3.75
Operational Code of the Politburo (Leites)	3.00
Red China's Fighting Hordes (Rigg)	3.75
Soviet Arms & Soviet Power (Guillaume)	3.50
Strange Alliance (Maj. Gen. Deane)	4.50

ATOMIC WEAPONS & GUIDED MISSILES

Effects of Atomic Weapons	3.00
Guided Missiles	1.00
How to Survive an Atomic Bomb (Gerstell)	1.95

ORDER ALL YOUR MAGAZINE SUBSCRIPTIONS FROM

COMBAT FORCES BOOK SERVICE

ONE ORDER
ONE RENEWAL
ONE ADDRESS CHANGE

WHEN YOU MOVE TAKES CARE OF EVERYTHING

Modern Arms & Free Men (Vannevar Bush) 3.50
Operation Sandstone—Eniwetok (White) 3.50
Sourcebook on Atomic Energy (Glasstone) 2.90

INTELLIGENCE & INVESTIGATION

Cartridge Identification (Munhall & White)
Vol. I—Centerfire Metric Pistol & Revolver Cartridges 7.50
Vol. II—Centerfire Amer. & British Pistol & Revolver Cartridges 7.50
Vol. I & Vol. II (if ordered together)..14.00
Cryptography (Smith) 3.00
Front Line Intelligence (Robb&Chandler) 2.50
Intelligence Is for Commanders 3.85
Modern Criminal Investigation 4.75
Strategic Intelligence (Kent) 3.00

FICTION

The Caine Mutiny (Wouk) 3.95
Capt. Horatio Hornblower (C.S.Forester) 4.00
Commodore Hornblower (Forester) 3.00
Guard of Honor (Cozzens) 3.50
Lieutenant Hornblower (Forester) 3.50
Lord Hornblower (Forester) 3.00
Melville Goodwin, U.S.A. (Marquand).. 3.75
Mr. Midshipman Hornblower (Forester) 3.00
Red Badge of Courage (Crane) 1.25
Song of Roland (Luquiens) 2.75
War and Peace (Tolstoy) 2.45

BIOGRAPHY

Abraham Lincoln (Benj. P. Thomas)..... 5.75
Alexander of Macedon (Harold Lamb)... 3.75
Bedford Forrest (Lytle) 4.00
Captain Sam Grant (Lloyd Lewis) 6.50
Douglas MacArthur (Lee & Henschell) 6.00
Eisenhower: Soldier of Democracy (Davis) 3.49
Genghis Khan (Lamb) 3.50
Geo. Washington (Douglas S. Freeman)
Vol. I & II 15.00
Vol. III & IV 15.00
Vol. V 7.50
All 5 vol. (boxed) 35.00
Napoleon (Ludwig) 1.25
Robert E. Lee (Freeman) 4 Vol. 25.00
Rommel: The Desert Fox (Brig. Young) 3.50
Sherman: Fighting Prophet (Lloyd Lewis) 5.00
Stonewall Jackson (G. F. R. Henderson) 6.50

LEADERSHIP & PSYCHOLOGY

Managing Men (Kraines) 3.95
Medal of Honor (Army) 4.50
Men Against Fire (S. L. A. Marshall).. 3.75
Psychology for the Armed Services (Boring) 4.00
Psychology for the Fighting Man 1.50

THE STAFF AND LOGISTICS

(See also INTELLIGENCE and MILITARY HISTORY)

American Military Government (Holborn) 3.50
Military Management for National Defense (Belshline) 6.00
Military Staff: Its History and Development (Hittle) 3.50
National Security & the General Staff (Maj. Gen. Nelson) 5.00
42 Million Tons to Eisenhower (Leigh) 3.00
Soldier's Load & the Mobility of a Nation (S. L. A. Marshall) 1.00
Technique for Adjutants (Chester)
Cloth 2.50
Paper 1.00

AMERICA'S WARS

Revolutionary War

Appeal to Arms (Wallace) 4.50
Valley Forge: The Making of an Army (Hill) 3.50
War of the Revolution (Ward) 15.00

War of 1812

War of 1812 (Adams) 3.00

The Civil War

The Blue and the Gray (2 vol.) 12.00
Mr. Lincoln's Army (Catton) 4.00
Glory Road: Fredericksburg to Gettysburg (Catton) 4.50
Lee's Lieutenants (Freeman)
3 Vol., each 7.00; Boxed set 21.00
Life of Billy Yank (Bell I. Wiley) 6.00
Life of Johnny Reb (Wiley) 6.00
Lincoln Finds a General (Kenneth Williams)
Vol. I & II 15.00
Vol. III 7.50
Personal Memoirs of U. S. Grant (New, annotated edition) 6.00
Divided We Fought (Donald) [Pictorial History] 10.00

The Western Frontier

Fighting Indians of the West 10.00

World War I

A Short History of World War I (Edmonds) 7.00
Infantry in Battle 3.00

World War II

AAF In World War II (Craven & Cate)
Plans & Early Operations 8.50
Europe: Torch to Point Blank 8.50
Europe: Argument to VE Day 8.50
Guadalcanal to Saipan 8.50
History of the U.S. Army in WW II (Office, Chief of Military History)
Procurement & Training of Ground Combat Troops 4.50
Okinawa: The Last Battle 7.50
Guadalcanal: The First Offensive 4.00
The Lorraine Campaign 10.00
Chief of Staff: Prewar Plans & Preparations 3.75
Washington Command Post (Operations Division) 3.25
War Against Germany (Pictorial)..... 3.25
War Against Germany & Italy (Pictorial) 3.50
Transportation Corps Responsibilities 3.25
The Persian Corridor & Aid to Russia 3.50
Three Battles (Typical regimental actions) 4.00
History of U.S. Naval Operations in WWII (Samuel Eliot Morison)
Battle of the Atlantic 6.00
Operations in N. African Waters..... 6.00
Rising Sun in the Pacific 6.00
Coral Sea, Midway & Submarine Actions 6.00
Struggle for Guadalcanal 6.00
Breaking the Bismarcks Barrier 6.00
Aleutians, Gilberts and Marshalls 6.00
U.S. Marines in World War II
Battle for Tarawa 1.50
Bougainville & Northern Solomons.... 2.00
The Guadalcanal Campaign 4.25
Saipan: Beginning of the End 3.25
Defense of Wake 1.25
Assault on Peleliu 2.50
Seizure of Tinian 2.50
Marine Aviation in the Philippines.... 2.50
Life's Picture Hist. of W.W.II..... 10.00
This Is Pearl (Millis) 4.00

High Command

Calculated Risk (Mark W. Clark) 5.00
Crusade In Europe (Eisenhower) 5.00
Fleet Admiral (King and Whitehill)..... 6.75
The Forrestal Diaries 5.00
On Active Service (Stimson) 5.00
Second World War (Winston S. Churchill)
The Gathering Storm 6.00
Their Finest Hour 6.00
The Grand Alliance 6.00
Hinge of Fate 6.00
Closing the Ring 6.00
A Soldier's Story (Omar N. Bradley)... 5.00
War As I Knew It (George S. Patton).. 4.50
War Reports (Marshall, King, Arnold).. 7.50

The War in Europe

Bastogne (S. L. A. Marshall) 3.00
Anzio Beachhead 1.50
Omaha Beachhead 1.75
St. Lo 1.25
Small Unit Actions 1.25
Stalingrad (Plevier) 3.00
The Struggle for Europe (Wilmot) 5.00
To Bizerte with II Corps ..... .50
Utah Beach to Cherbourg 2.00
Volturno ..... .40
Winter Line ..... .35

War in the Pacific

Capture of Attu (S. L. A. Marshall)..... 2.00
Capture of Makin ..... .35
Hard Way Home (Brady) [PW Experience] 3.50
History of Marine Corps Aviation in WWII (Rob't Sherrod) 6.50
Island Victory (S. L. A. Marshall) 2.00
Papuan Campaign ..... .55
Small Unit Actions 1.25
Uncommon Valor (Brief histories of the six Marine divisions) 3.00

Amphibious War

Down Ramp (Heavey) 5.00
U.S. Marines & Amphib. War (Crowl & Isely) 7.50

The Enemy

The Other Side of the Hill (Liddell Hart) 3.50
Panzer Leader (Guderian) 7.50

KOREA

Bill Mauldin in Korea 3.95
Face of War (Chas. & Eugene Jones) [Text & Pix] 5.00
This Is War (Duncan) [Text & Pix].... 4.95

GENERAL MILITARY HISTORY

American Campaigns (Steele)
Vol. I (Text) 6.00
Caesar's Gallic Campaigns 2.50
Decline & Fall of the Roman Empire (Gibbon) 3 Volumes, each volume..... 2.45
Fifteen Decisive Battles (Creasey)..... 1.25
Infantry Journal Reader 3.00
Letters of Private Wheeler 3.75
War through the Ages (Montross) 7.50
Warfare (Spaulding, Nickerson & Wright) 5.00

STRATEGY & PRINCIPLES OF WAR

Airborne Warfare (Maj. Gen. Gavin).... 3.00
Battle Studies (DuPicq) 2.50
Defense of the West (Liddell Hart)..... 4.00
Machine Warfare (J. F. C. Fuller) 2.50
Mahan on Sea Power 3.50
Makers of Modern Strategy (Earle) 5.00
Military Institutions of the Romans 1.50
Napoleon's Memoirs 7.50
On War (Clausewitz) 2.50
Reveries on the Art of War (Dellaze).... 2.00
Strategic Air Power (Possony) 5.00
War and Civilization (Toynbee) 2.50

GENERAL HISTORY

Across the Wide Missouri (DeVoto).....10.00
The Course of Empire (DeVoto) 6.00
Life In America (Davidson) 20.00
Life's Picture History of Western Man...10.00
Shorter Cambridge Medieval History (2 vol.) 12.50
The Year of Decision: 1846 (DeVoto).... 4.00

MILITARY JUSTICE

Manual for Courts-Martial, 1951 ..... 2.75
Practical Manual of Martial Law (Wiener) 2.50
Uniform Code of Military Justice (Wiener) 3.50

THE ARMY & ITS INSTITUTIONS

Beginnings of the U.S. Army (Jacobs).. 5.00
West Point (Crane & Kelley [Text & Pix] 7.50
Men of West Point (Dupuy) 3.00

MILITARY WEAPONS

Book of the Garand (Maj. Gen. Hatcher) 6.00
How to Shoot a Rifle 1.00
Machine Gun (China) 5.00
NRA Book of Small Arms (W.H.B.Smith)
Vol. I: Pistols & Revolvers 10.00
Vol. II: Rifles 10.00
Vol. I & II boxed 17.50
Small Arms of the World (W. H. B. Smith) 6.00
Weapons of World War II (Barnes)..... 7.50

SPORTING WEAPONS

Gunsmithing Simplified (MacFarland)... 6.95
Huntin' Gun (Rodgers) 3.50
Story of Winchester 10.00
Ultimate in Rifle Precision (Whelan).... 6.00
Why Not Load Your Own (Whelan)..... 3.50
Your Big Game Rifle (Stebbins) 5.00

HUNTING & SPORTS

Famous Running Horses (John F. Wall)..10.00
Hunter's Encyclopedia (Camp) 17.50

DICTIONARIES, ATLASES, ETC.

American College Dictionary
Plain 5.00
Thumb Indexed 6.00
American Everyday Dictionary 1.00
American Vest Pocket Dictionary ..... .95
American Oxford Atlas 10.00
Columbia Encyclopedia (3d Ed.) 25.00
Goode's School Atlas 5.75
Roget's Thesaurus (Revised)
Regular 4.50
Thumb Indexed 5.00
Russian-English, English-Russian Pocket Dictionary 1.95
Talking Russian Before You Know It.... 1.75
Thorndike-Barnhart Comprehensive Desk Dictionary
Plain 2.95
Thumb Indexed 3.50
Deluxe (flexible binding) 3.95
Webster's Geographical Dictionary 3.50
Webster's Collegiate Dictionary 6.00

PRACTICAL SCIENCE

Art of Clear Thinking (Flesch) 2.75
Art of Plain Talk (Flesch) 2.50
Art of Readable Writing (Flesch) 3.00
Mathematics for the Millions 3.95
Sexual Behavior in the Human Male (Kinsey) 6.50
Story of Maps (Brown) 7.50
Survival 1.50

GUNS, STATIONERY, ETC.

Johnson Target Gun 6.95
Stik-tacks (Box) 1.00

UNIT HISTORIES

Down Ramp (1st, 2d, 3d, 4th, 5th, 6th Spec Eng Brig) 5.00
First Cavalry Division 3.00
Night Climb (10th Mountain Div.) 2.50
Uncommon Valor (all Marine Divs.)..... 3.00
3d Engineer Special Brigade 6.00
13th Inf. Regt. 7.50
Saga of the XX Ghost Corps 7.50
50th Fighter Group 10.00
328th Regiment 2.50
130th Regiment 5.00
129th Regiment 5.00
305th Regiment—Second to None 5.00
363d Regiment 5.00
376th Regiment 5.00
398th Regiment 5.00
409th Regiment 5.00
508th Regiment 5.00
3d Infantry Division 6.00
6th Infantry Division 5.00
11th Airborne Division—The Angels..... 5.00
24th Inf Div—Children of Yesterday..... 3.00
27th Infantry Division 10.00
29th Infantry Division—29 Let's Go!..... 5.00
30th Infantry Division 4.00
33d Infantry Division—Golden Cross.... 7.50
37th Infantry Division 7.50
41st Infantry Division—The Jungleers..10.00
71st Infantry Division 1.50
76th Infantry Division 5.00
77th Inf Div—Ours To Hold It High.... 6.00
83d Inf Div—Thunderbolt Across Europe 3.50
84th Inf Div—Battle of Germany 5.00
85th Infantry Division 5.00
90th Infantry Division 5.00
91st Infantry Division 5.00
94th Infantry Division 5.00
96th Signal Communique 1.25
101st AB Div—Rendezvous With Destiny 7.50
101st Airborne Division—Epic of 2.50
104th Inf Div—Timberwolf Tracks 4.00
106th Inf Div—Lion in the Way..... 5.00
Americal Division 6.00
442d Combat Team—Americans 5.00
First Special Service Force 5.00
1st Marine Division 6.50
2d Marine Division—Follow Me! 6.00
3d Marine Division 5.50
4th Marine Division 5.00
5th Marine Division—The Spearhead.... 6.50
6th Marine Division 5.00
9th Marines—Striking Ninth 5.00
5th Army—Salerno to the Alps 6.00
9th Army—Conquer 4.50

ORDER FORM

COMBAT FORCES BOOK SERVICE

1529 18th St., N.W., Washington 6, D. C.

Name .....

Street Address .....

Town or APO ..... Zone .... State ....

☐ I enclose *$..... ☐ Send COD

☐ Please charge my account

☐ Send bill to Company Fund .....

PLEASE ADD 25¢ TO YOUR TOTAL PAYMENT TO COVER HANDLING AND SHIPPING CHARGES.

Please send the following books:

.....

.....

.....

.....

.....

.....

.....

.....

*SAVE 15% WITH BOOK DIVIDEND COUPONS. If you remit with this order, we will include with your shipment a bonus of FIFTEEN PER CENT of the cash remitted in Book Dividend Coupons, which can be used to purchase more books up to the time of expiration stamped on each coupon. (Coupons cannot be given on orders for organizations.)

(353)

Off-Duty Reading

Mountain-Climbing, Diving and Underground Adventures

GOOD books on adventure and exploration are getting harder to come by all the time, but every once in awhile the publishers pay off with the jackpot. This time it is two remarkable books. The first one is *Annapurna*, by Maurice Herzog (Dutton, $5.00), the almost incredible story of the ascent of the highest mountain man has yet conquered. There have been great books on mountain-climbing before, but none has seemed to catch so well the triumph of the human spirit that conquers the great mountains of the world. Certainly nothing less could have conquered Annapurna, for the effort involved to make the ascent, and to endure the tortures of frozen hands and feet during the descent goes far beyond the capacity of mere flesh and blood.

THE SILENT WORLD, by Captain J. Y. Cousteau (Harper, $4.00), takes us in exactly the opposite direction. Captain Cousteau and his colleagues developed the aqualung diving technique that permits free dives and independent movement to depths up to 300 feet. The equipment consists of three small tanks of compressed air, an air regulator that feeds air to the diver automatically, breathing tubes, and watertight glass mask over eyes and nose. The diver has freedom of movement unknown to the helmet diver. Captain Cousteau is a scientist as well as a diver, and has recorded his experiences clearly and brilliantly, debunking on the way a lot of the pure hokum about diving that has accumulated over the years, much of it in the "sea-monster" category. He reports from personal experience that most of the monsters of the deep, including the dread octopus, the moray eel, and the ray, will not attack the "menfish," and want little more than to be let severely alone. *The Silent World* is a book that adds immeasurably to our knowledge of the sea and of the reactions of the men who go into its depths. It is packed with every sort of thrill and adventure, and the undersea photographs, many of them in a riot of color, are the finest we've ever seen in print.

BRUCE MARSHALL's *The White Rabbit* (Houghton Mifflin, $3.50) is one of the best stories of underground work and escape to come out of World War II. The White Rabbit was RAF Wing-Commander F. F. E. Yeo-Thomas, otherwise known to the French Resistance as Shelley. He was responsible for trying to coordinate French Resistance activities, both on the ground and in England, and was widely regarded as one of Britain's top agents. This book is a real thriller, but it is also a very thorough record of the work of an agent in an enemy-occupied country and of the intricate planning necessary to keep an underground operation going. It is also an almost too-graphic account of what happens when such an agent is captured and tortured, as Yeo-Thomas was.

A. P. HERBERT, the man of many talents, has turned to Napoleon for material for his new novel, *Why Waterloo* (Doubleday, $4.00). Mr. Herbert has written some forty books and a dozen musical comedies, has been a Member of Parliament, and is an accomplished scholar, as this book shows. *Why Waterloo* is a novel of Napoleon in the ten months before the Hundred Days, an attempt to find out what prompted the Emperor to attempt to seize power again. The book is soundly and thoroughly researched and, though many students of Napeoleon may disagree with the author, they'll have a hard time proving him wrong. "The charge," says Mr. Herbert, "is not that one man, through wild ambition, would not accept defeat. It is that the many, having no magnanimity, were unfit for victory. Napoleon did not 'break out' of Elba: he was driven out."

READERS of COMBAT FORCES JOURNAL will remember Stefan T. Possony for his *Strategic Air Power* (Infantry Journal Press, $5.00), still the most comprehensive and accurate study we have of the uses of air power. Dr. Possony has now written *A Century of Conflict* (Regnery, $7.50), an equally comprehensive study of Communist techniques of world revolution as they have evolved through the last hundred years. He shows in detail the essentially military characteristics of communist strategy, and how each phase of the program fits into the Soviet master plan. *A Century of Conflict* is by no means light reading, but it is necessary reading for the student of modern war.—O.C.S.

Weber's statistics prove. It passed its greatest test in Sherman's campaign.

Mr. Black's book points up the fact that for the South, with its initial advantage of interior lines, it had to be a railroad war from start to finish. But the Confederacy didn't do its best with what it had. The Union's strong government gave President Lincoln powers he was free to use if he had to. The Confederacy's Constitution emphasized state authority, and under such a setup the central government dared not risk placing its carriers under effective control. But material troubles were many. Not a new rail was produced during the war; gauges were of various widths and schedules erratic; rolling stock and shops couldn't operate for lack of metal; there were too many gaps in what should have been continuous lines; organization in the industry was loose and civilian operators unwilling to make serious sacrifices; operating manpower suffered by reason of a faulty conscription policy. Mr. Black's presentation is further evidence that good military history can be written in popular language. His text is enriched by interesting illustrations and many fine maps (Weber's has neither). For students of the Civil War and for those interested in the growth of the iron horse, the almost simultaneous publication of these two works should be a happy event.—N.J.A.

BOOKS RECEIVED

THE HERBLOCK BOOK. Text and Cartoons by Herbert Block. The Beacon Press. 244 Pages; $2.75. Cartoons and prose by the Washington *Post's* famous political cartoonist.

PSYCHOLOGY IN THE WORLD EMERGENCY. By J. C. Flanagan and others. University of Pittsburgh Press. 198 Pages; $4.00.

DESPERATE WOMEN. By James D. Horan. G. P. Putnam's Sons. 336 Pages; Illustrated; Index; $4.00. The adventure stories of thirteen women.

VERDICT IN KOREA. By Robert T. Oliver. Bald Eagle Press. 207 Pages; $4.00.

THE WOMAN WITH THE WHIP. By Maria Flores. Doubleday & Company, Inc. 268 Pages; $3.50. A biography of the late Eva Peron by a woman who was born and raised in Argentina.

LIBERAL ARTS DICTIONARY in English, French, German, Spanish. Edited by Mario A. Pei and Frank Gaynor. Philosophical Library. 307 Pages; $6.00.

CITIZENS OF THE WORLD. By Stringfellow Barr. Doubleday & Company. 285 Pages; $3.00.

SOVIET OPPOSITION TO STALIN: A Case Study in World War II. By George Fischer. Harvard University Press. 230 Pages; Index; $4.00.

WIND, STORM AND RAIN: The Story of Weather. By Denning Miller. Coward-McCann, Inc. 177 Pages; Illustrated; Index; $3.95.

BASIC MILITARY TEXTS DESIGNED TO HELP—

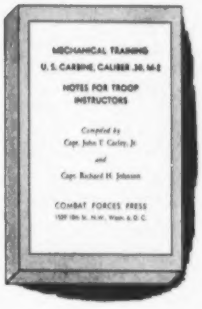
COMPANY OFFICERS AND NONCOMS

EMBARRASSMENT-SAVERS which will pull you out of a hole. Don't be caught short! With these manuals, designed for *you,* impossible questions become simply hard, and hard questions become easy.

TIME-SAVERS which will short-cut you through pages and pages of written text right to the answer. Don't waste time looking for obscure information or instructional material when the key to it is here. Buy now—and let our manuals work for you.

SPECIAL PACKAGE OFFER . .

NOTES FOR TROOP INSTRUCTORS



Still the finest training aids ever devised for the junior officer or NCO, NOTES FOR TROOP INSTRUCTORS give you the *essential* information on basic subjects. You'll find each set of NOTES a complete, ready-to-use set of lecture notes—a full, detailed lesson plan with necessary training aids —and a ready reference to further study of your subject.

Now you can buy all 9 sets of NOTES FOR TROOP INSTRUCTORS—*a $10.75 value for only $9.25* if you order all the NOTES together.

ALL THESE FOR $9.25

Elementary Map Reading, $1.00 • Rifle, M1, Mechanical Training, $1.75
Combat Formations, $1.00 • Carbine, M2, Mechanical Training, $1.25
First Aid, $1.00 • 2.36" Rocket Launcher, $1.25
Interior Guard Duty, $1.50 • Military Courtesy & Discipline, $1.00
Pistol, Cal. .45, M1911 & M1911A1, Mechanical Training, $1.00

TECHNIQUE FOR ADJUTANTS

BY MAJOR ARTHUR M. CHESTER

Smooth functioning of the administrative office generally receives little praise. But let things get out of whack and the roof falls in. No adjutant can afford to let this happen. Confusing as the "paper-work" is at first, it must be done. Here is a complete guide that shows the inside picture and how to work it through. It outlines the responsibilities of the job, whether it be on the battalion, regimental, divisional, or post level; gives: techniques, hints on management, ideas for organizing work, and best of all, ready reference points for a series of several hundred questions asked in the filling out of the necessary forms and reports on inspections, publications, supplies and personnel records.

Cloth, $2.50 **Paper, $1.00**

BATTERY DUTIES

BY COLONEL ROBERT F. COCKLIN
and
MAJOR MARK M. BOATNER, III

If you haven't found out by now that *Battery Duties* will save you time and energy—and contribute to the smooth, efficient operation of your battery, then you're behind the times. Because *Battery Duties* will tell you what your job is in the battery and show you all the necessary details of it clearly and accurately.

Remember, there's a lot more to the artilleryman's job than you'll find in the FMs and TMs. *Battery Duties* has been especially prepared to fill in all those blank spots—to help you do *your* job better.

Cloth, $2.50 **Paper, $1.50**

UNITED STATES ARMY
COMBAT FORCES *Book Service*
1529 18th St., N.W. Washington 6, D. C.

POSTMASTER: If this magazine is addressed to a member of the United States Military or Naval Service, whose address has been changed by official orders, it may be forwarded without additional postage. See Par. 10, Sec. 769, P. L. & R. Entered as second class matter at the Post Office at Washington, D. C. Additional Entry at Richmond, Va.

RETURN POSTAGE GUARANTEED BY THE COMBAT FORCES JOURNAL
1529 18th St., N.W., Washington 6, D. C.